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AN ESSAY ON BLINDNESS,

In a LETTER to a

PERSON OF DISTINCTION;

Reciting the moſt intereſting Particulars relative to Perſons born Blind, and thoſe who have loſt their Sight.

Being an Enquiry into the Nature of their Ideas, Knowledge of Sounds, Opinions concerning Morality and Religion, &c.

Interſperſed with ſeveral Anecdotes of

SANDERSON, MILTON, AND OTHERS.

With COPPER-PLATES elucidating Dr. SANDERSON's Method of Working

GEOMETRICAL PROBLEMS.

Tranſlated from the French of

M. DIDEROT,

Phyſician to His moſt Chriſtian MAJESTY,

LONDON:

Printed for J. BARKER, No. 7, Little RUSSELL-COURT, DRURY-LANE.

[Price 1s. 6d.]

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THE PREFACE.

IT is proper the public ſhould be informed of the author's motive for writing the following letter. A foreign phyſician of ſome reputation had bills put up at the corners of all the ſtreets at Paris, that on ſuch a day he would give ſight to a girl who was born blind. The philoſophers were one and all ſtricken at the confidence with which this kind of prodigy was thus publiſhed: and the celebrated Mr. Diderot deſired the phyſician to allow him the favour of being preſent

at

at the operation. It was anſwered that his preſence would, to be ſure, be a great honour; however, dreading the philoſopher's keen eye, he performed the operation in private; but, at the ſame time, was willing to make the honour of it as public as poſſible. On this, the philoſopher determined to lay open the fraud, which he did very ingeniouſly in this letter; a letter ſtored with ſuch refined ideas, and ſuch profound inveſtigations, that it may well be accounted the ſtandard of human wit and penetration. The impoſtor ſtoutly maintained his point, in which he was ſo ſeconded by the monaſtick Phalanx, that, as proves but too commonly the caſe, he got the better, and the philoſopher was ſent to Vincennes-caſtle.

But

But the truth came at length to light, and falſity was exploded with ignominy. Mr. Diderot's letter could not be ſufficiently extolled, and, as a complete crown of its glory, Mr. D'Alembert has given a moſt judicious extract of it in the Encyclopedia, with obſervations, omitted here purely to avoid ſwelling the price of this admirable compoſition, but which throw great light on the work itſelf, and may ſerve as a model to reviewers and others, whoſe buſineſs is to ſelect the plan, ground-work, and eſſence of books. I have added a few remarks of my own, which aroſe in me as I peruſed the book, humbly offering them to the reader's notice.

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LETTER

ON THE

BLIND.

MADAM,

IT was no more than what I apprehended, that the blind girl, whom Mr. Reaumur had couched for a cataract, would not inform you of what you was curious to know; but I little thought that it would neither be her fault nor yours. I have, in perſon, and by means of his beſt friends, and by paying him many compliments, applied to her benefactor, but without the leaſt ſucceſs; and the firſt dreſſing will be taken off, without your being admitted to ſee it. Some perſons of the firſt diſtinction have had the

honour of being put on a level with philoſophers in this ſenſe: in a word, it was only before ſome eyes of no conſequence he would remove the veil. If you would know why that wonderful operator makes ſuch a ſecret of experiments, at which you think too great a number of intelligent witneſſes cannot be preſent, my anſwer is, that the obſervations of ſuch a celebrated perſon do not ſo much ſtand in need of ſpectators, whilſt making, as of hearers, when made. Thus diſappointed, Madam, I betook myſelf to my firſt intention, and, being obliged to go without an experiment, in which I ſaw but little to be gained, either for my own inſtruction, or yours, but which Mr. Reaumur will doubtleſs improve to a much higher purpoſe, I fell to philoſophizing with my friend on the important matter which is the object of it. Happy, if you will be pleaſed to accept the narrative of one of our converſations, inſtead of the ſight which I had too haſtily promiſed you.

On the very day that the Pruſſian performed

formed the operation of the cataract on Simoneau's daughter, we went to have ſome talk with the Puiſaux man who had been born blind. He is poſſeſſed of good ſolid ſenſe, is known to great numbers of creditable perſons, underſtands ſomething of chemiſtry, and has attended the courſes of botany in the king's garden with tolerable improvement. His father was an eminent profeſſor of philoſophy in the univerſity of Paris, and left him ſuch a fortune, as would have very well ſufficed for the ſenſes remaining to him; but in his youth he was carried away by love of pleaſure, which, with the diſhoneſty of ſome others, ſo reduced his domeſtic affairs, that he retired into a little town in Provence, from whence every year he takes a journey to Paris, bringing with him liquors of his own diſtilling, and which give great ſatisfaction. Theſe, Madam, are circumſtances, indeed, not very philoſophical; but, on that very account, the fitter to make you conclude, that the perſon I am ſpeaking of is not imaginary.

It was about five in the afternoon when we came to the blind man's houſe, where we found him hearing his ſon read with raiſed characters: he had not been up above an hour; for you muſt know that his morning is our evening; carrying on his domeſtic affairs, and working while others are aſleep. At midnight he is free from diſturbance himſelf, and is not troubleſome to others. His firſt care is to put in its place every thing that has been diſplaced during the day; that his wife, at her getting up, commonly finds the houſe ſet to rights. The difficulty which blind perſons have in finding things miſlaid, makes them love regularity and exactneſs; and I have obſerved, that thoſe about them imbibe that quality, whether from the good example ſet them by the blind, or from an humane concern for them. The blind would, indeed, be very unhappy, without ſuch regard from thoſe about them, nay, we ourſelves would feel the want of it. Great ſervices are like large pieces of gold or ſilver, which we ſeldom

ſeldom have occaſion to make uſe of; but little complaiſances are as current caſh, which we are continually either receiving or paying away.

This blind man judges very well of ſymmetries. Symmetry, which, perhaps, is no more than a matter of mere compact among us, is certainly ſuch in many reſpects, between a blind man, and thoſe who have their ſight. A blind man ſtudies, by his touch, that diſpoſition required between the parts of a whole, to entitle it to be called fine; and thus, at length, attains to a juſt application of that term. But in ſaying, *that is fine*, he does not judge; it is no more than repeating the judgment of thoſe who ſee; and is not this the caſe of three fourths of thoſe who give their verdict on a play, or a book? Beauty, to a blind man, is but a word when abſtracted from utility; and wanting an organ, how many things are there, the utility of which lies out of his verge? Are not the blind extremely to be pitied in accounting

nothing fine, unleſs it be likewiſe good? How many admirable things are loſt to them? The only compenſation is, their having ideas of the beautiful, which, if leſs extenſive, are more clear than thoſe of many keen-ſighted philoſophers, who have compoſed prolix diſſertations on it.

He is continually talking of looking-glaſſes. You are ſenſible that he does not know what the word looking-glaſs means, yet is he never known to put a glaſs in a wrong light. He expreſſes himſelf as ſenſibly as we on the qualities and the defects of the organ which is wanting in him. If he annexes no idea to the terms he makes uſe of, yet has he this advantage over moſt other men, that he never uſes them improperly. He diſcourſes ſo well and ſo juſtly of ſo many things abſolutely unknown to him, that his converſation would conſiderably leſſen the weight of that inference which, without knowing, wherefore, we all draw from what paſſes in ourſelves, to what paſſes within others.

I aſked him what he meant by a look-

ing-

ing-glaſs? "A machine," anſwered he, "which puts relievo things at a diſtance "from themſelves, if when properly placed "with regard to it: it is like my hand, "which, to feel an object, I muſt not put "on one ſide of it." Had Deſcartes been born blind, he might, in my opinion, have hugged himſelf for ſuch a definition. Do but conſider, I beg of you, what an ingenious combination of ideas it implies. This blind man has no other object, but by the touch. He knows, from the account of others, that objects are known by means of the ſight, as to him by the touch; at leaſt it is the only notion he can form of them. He farther knows, that there is no ſeeing one's own face, though it may be touched. He muſt therefore conclude ſight to be a kind of touch, reaching only to objects different from our face, and at a diſtance from us. The touch gives him an idea only of relief: "therefore," adds he, "a looking-"glaſs is a machine repreſenting us in re-"lief out of ourſelves." How many fa-

mous philoſophers have laboured with leſs ſubtility in the purſuit of notions as falſe? But how ſurprizing muſt a looking-glaſs be to this blind man? How much muſt his amazement have increaſed on our informing him, that there are ſome of thoſe machines which magnify objects, others which, without duplicating them, put them out of their place, bring them nearer, remove them farther, cauſe them to be perceived, and lay open the moſt minute parts to the eyes of the naturaliſts; that ſome again multiply them by thouſands, and that ſome appear totally to change the figure of objects? Concerning theſe phænomena, he aſked us abundance of ſtrange queſtions; as, "Whether none, but thoſe called naturaliſts, ſaw with the microſcope; and whether aſtronomers alone ſaw with the teleſcope? Whether the machine which magnifies objects be larger than that which leſſens them? Whether that which brings them nearer was ſhorter than that which removes them farther off?" And not conceiving how that other

ther ſelf, which, according to him, the looking-glaſs repreſents in relief, ſhould not be tactile, " So," ſaid he, " there's two " of our ſenſes ſet at variance by a little " machine: a more perfect machine might " poſſibly reconcile them, without the ob- " ject's being ever the more real for that; " and perhaps a third, ſtill more com- " pleat, and leſs illuſory, would make " them vaniſh, and ſhew us our miſtake."

And what do you take eyes to be? ſaid M. D.---- " They are," ſays the blind man, " an organ, on which the air has the ef- " fect which my ſtick has on my hand." This anſwer amazed us, and whilſt we were looking at one another, wrapped in admiration, " So true is this," continued he, " that on my putting my hand be- " tween your eyes and an object, my " hand is preſent to you, but the object " abſent. It is the ſame with me when I " am ſeeking one thing with my ſtick, and " meet another."

Madam, only turn to Deſcartes's Dioptics, and there you will ſee the phænome-

na of ſight illuſtrated by thoſe of the touch; and optic plates full of men buſied in ſeeing with ſticks. Deſcartes, and all his ſucceſſors, have not been able to give us clearer ideas of viſion; and that great philoſopher was, in this reſpect, no farther ſuperior to the blind man, than a common man who has the uſe of his eyes.

None of us thought of queſtioning him concerning painting and writing; but it is evident that there are no queſtions in which his compariſons would not have borne him out; and I make no doubt but he would have ſaid, that to go about reading or ſeeing without eyes, was like ſeeking after a pin with a faggot ſtick. We only talked to him of thoſe kinds of glaſſes which exhibit objects in relief, and are both ſo very ſimilar to, and ſo very different from, our looking-glaſſes; but theſe we perceived rather contradicted than coincided with his idea of a looking-glaſs; and he was apt to think, that a painter might, perhaps, paint a looking-glaſs, and that thus it came to repreſent objects in colours.

We

We afterwards ſaw him thread very ſmall needles. May I beg the favour of you, Madam, here to ſuſpend your reading, and think how you would go about it, were you in his caſe? Should no expedient offer itſelf, I will tell you that of the blind man's. He places the needle's eye tranſverſally between his lips, and in the ſame direction as his mouth; then, by the help of his tongue and ſuction, he draws in the thread, which follows his breath, unleſs it be much too large for the eye; but, in that caſe, he who has his ſight is little better off.

He has a prodigious remembrance of ſounds; and the infinite diverſity we perceive in faces, he perceives in voices, with numberleſs minute gradations, which eſcape us, as not ſo much concerned to obſerve them. Thoſe gradations are, to us, like our own face; as of all the men that we have ever ſeen, he whom we ſhould leaſt recollect, is our very ſelf. We take notice of faces only for better knowing the perſons; and that we do not remember our

own is, becauſe we ſhall never be liable to take ourſelf for another perſon, or another for ourſelf; then, the helps which our ſenſes reciprocally afford to each other, hinder their improvement. It is not here only that I ſhall have occaſion to make this remark.

On this head our blind man ſaid, "That "he ſhould think himſelf a pitiable object "in wanting thoſe advantages which we "enjoy; and that he ſhould have been "apt to conſider us as ſuperior intelli-"gences, had he not a hundred times "found us very much inferior to him in "other reſpects." This reflection gave riſe to another in us. This blind man, ſaid we, values himſelf as much, and perhaps more, than we who ſee. Why then, if the brute reaſons, and it is ſcarce to be doubted, why, on weighing its advantages over man as better known to it than thoſe of man over it, ſhould it not make a like inference? He has arms, perhaps ſays the gnat, but I have wings. If he has weapons, ſays the lion, have we not claws?

claws? The elephant will look on us as inſects; and all the animals, very readily allowing us a reaſon, with which we ſhould at the ſame time ſtand in great need of their inſtinct, will ſet up to be endued with an inſtinct, by means of which they do very well without our reaſon.

One of our company aſked the blind man, whether he ſhould not be very glad to have eyes? "Were it not for curio-"ſity," ſaid he, "I would full as lieve "have long arms. My hands, I think, "would inform me better of what is do-"ing in the moon, than your eyes or your "teleſcopes. Beſides, the eyes ſooner "ceaſe to ſee, than the hands to touch; "that to improve the organ which I have, "would be as good as to give me that "which is wanting in me."

This blind man points with ſuch exactneſs at the place whence a noiſe comes, that I make no doubt the blind may, by practice, become very dexterous, and very dangerous. Here is a paſſage which will ſhew you, how imprudent it would be to ſtand

ſtand the throwing of a ſtone, or diſcharging of a piſtol, by him, were he in the leaſt uſed to that weapon. He had, in his youth, a quarrel with one of his brothers, who came off but badly. Provoked at ſome inſulting language, he laid hold of the firſt object which came to hand, threw it at him, and hit him directly on the forehead, ſo as to lay him flat on the ground.

This, with ſome other adventures of the like kind, cauſed him to be brought before the police. The blind are proof againſt all thoſe enſigns of power which make ſuch ſtrong impreſſions on us. He made his appearance before the magiſtrate as his equal, and without being in the leaſt intimidated by any of his threats. "What would you do to me?" ſaid he, to M. Herault. "I will commit you to the "dungeon," anſwered the magiſtrate. "As "to that, Sir," replied the blind man, "I have been in one theſe twenty-five "years." There was an anſwer, Madam; and what a text for one, who is ſo fond of moralizing,

moralizing, as your humble ſervant! We go out of life, as from a ſplendid entertainment; the blind man, as out of a dungeon. We may poſſibly have more pleaſure in living than he, but certainly death to him is a much leſs diſagreeable affair.

The blind man judges of the nearneſs of fire by the degrees of heat; of the fullneſs of veſſels, from the noiſe made by liquors which he decants into them; and of the proximity of bodies, by the action of the air on his face. So ſenſible is he of the leaſt change in the atmoſphere, that he can diſtinguiſh a ſtreet from a turn-again. He has a wonderful faculty in determining the weights of bodies, and the capacities of veſſels; and of his arms he has made ſuch exact ballances, and his fingers are compaſſes ſo well known to him from numberleſs experiments, that in this kind of ſtatics, I will always wager on our blind man's head againſt twenty perſons, with all their eyes about them. The poliſh of bodies has ſcarce fewer gradations

to

to him than the ſound of voices; and there is no danger of his miſtaking another for his wife, unleſs he was to be a gainer by the exchange. Yet is it very probable, that among blind people, wives would be in common, or their laws againſt the adultereſs muſt be ſevere indeed; ſo very eaſy would it be for wives to deceive their huſbands, by concerting a ſign with their gallants.

He judges of beauty by the touch: in this, however, there is no great myſtery; but what is not ſo eaſy to be comprehended is, that he includes in this conjecture, pronunciation, and the ſound of the voice. I wiſh anatomiſts would inform us, whether there is any relation between the parts of the mouth and the palate, and the external form of the face. He turns very neatly, does pretty pieces of needle-work, levels with a ſquare, and makes up and takes to pieces common machines. He is ſo far ſkilled in muſic, as to perform a piece after being told the notes, and their value. He eſtimates the duration of time much more

more preciſely than we, by the ſucceſſion of actions and thoughts. A ſmooth ſkin, firm fleſh, an elegant ſhape, a ſweet breath, a mellow voice, a graceful pronunciation, are qualities on which he ſets a great value.

He married to have eyes of his own, which ſuperſeded a former intention of taking into partnerſhip with him a deaf man, to find eyes, as he, in return, would contribute ears. I could not ſufficiently wonder at his ſingular addreſs in a great many things; and on our expreſſing our ſurprize, "I perceive, gentlemen," ſays he, "that you are not blind: you are a-"ſtoniſhed at what I do, and why not as "much at my ſpeaking?" I believe there is more philoſophy in this anſwer, than what he himſelf dreamed of. The facility with which we all are brought to ſpeak, is not a little ſurprizing. It is only by a ſeries of ingenious and profound combinations of the analogies obſerved between objects out of the verge of ſenſe, and the ideas they raiſe, that we come to annex

annex an idea to many terms not repreſented by ſenſible objects; and, conſequently, learning to ſpeak ſhould be more difficult to a blind man than to any other, the number of objects, without the verge of his ſenſes, being much greater, and thus his field for comparing and combining, much more limited. How, for inſtance, can the word phyſiognomy imprint itſelf on his memory? It is a kind of comelineſs, conſiſting in objects ſo little ſenſible to a blind perſon, that for want of its being ſufficiently ſo even to us who ſee, we ſhould be at no little loſs to explain very preciſely what phyſiognomy is. If the eyes be the parts in which it chiefly reſides, then the touch can give us no information; and, beſides, what does a blind man know of dead eyes, languiſhing eyes, briſk eyes, expreſſive eyes, &c.?

I infer from thence, that we unqueſtionably derive great advantages from the concurrence of our ſenſes, and our organs; ſtill would it be quite another thing, did we uſe them ſeparately, and never employ two,

two, where one alone would ſuffice. To add the touch to the ſight, when our eyes will do the buſineſs, is like putting to a carriage with two horſes, already ſufficiently ſtout, a third, which will draw one way, while the others draw another.

As to me it has always been very clear, that the ſtate of our organs and our ſenſes has a great influence on our metaphyſics and our morality; and that our moſt intellectual ideas, in a great meaſure, depend on the conformation and texture of our bodies, I put ſome queſtions to the blind man concerning the vices and virtues. I immediately perceived that he had a violent averſion to theft; poſſibly for two reaſons, it being an eaſy matter to ſteal from him without his perceiving it; and ſtill more, perhaps, that he could be immediately ſeen, were he to go about filching. Not that he is at any loſs to ſecure himſelf againſt that ſenſe which he knows we have above him, or that he is but awkward at hiding what he might ſteal. Modeſty

deſty he makes no great account of. He would ſcarce underſtand the uſe of apparel, were it not for the weather; and he frankly owns, he cannot think why one part of the body is covered more than another; and ſtill leſs, how, among thoſe parts, the preference is given to ſome, which, from their uſe, and the indiſpoſitions to which they are ſubject, ought rather to be kept free. Though living in an age when philoſophy has rid us of a great number of prejudices, I don't think we ſhall ever go ſuch a length as to ſet aſide the prerogatives of modeſty, ſo abſolutely as this blind man. Diogenes would have been no philoſopher in his account.

As of all the external ſigns which raiſe our pity and ideas of pain, the blind are affected only by complaint, I have, in general, no high thoughts of their ſympathy and tenderneſs. What difference is there to a blind man between him who is making water, and him whoſe blood is guſhing out, but makes no complaint? And we ourſelves;

ourſelves; where is our compaſſion, when diſtance, or the ſmallneſs of objects, render them the ſame to us, as the want of ſight does to the blind? So near a-kin are our virtues to our manner of ſenſation, and the degree in which external things affect us! Nay, I make no doubt but that, ſetting the law aſide, many could ſooner kill a man at ſuch a diſtance as to ſeem no bigger than a ſwallow, than cut an ox's throat with their own hands. We pity a horſe in pain, and we make nothing of cruſhing an ant; and ſtill is it not by the ſame principle that we are moved? Ah, Madam, how different is the morality of the blind from ours? How different would that of a deaf man likewiſe be from his? And how deficient, to ſay nothing more, would our morality appear to one with a ſenſe more than we have?

Our metaphyſics and theirs agree no better. How many of their principles are mere abſurdities to us, and *vice verſa?* Concerning this, I might enter into a detail, which I am pretty certain would entertain

tertain you, but which a ſet of exceptious men exclaim againſt, as profaneneſs and infidelity, as if it was in my power to make the blind perceive things otherwiſe than they do. I ſhall therefore only obſerve one thing, and that, I believe, every one muſt allow: it is, that the mighty argument drawn from the wonders of nature, is a very weak one to the blind. The facility with which we, as it were, create freſh objects, by means of a ſmall glaſs, is ſomething more incomprehenſible to them than conſtellations, from the ſight of which they are totally excluded. That lucid globe, moving from eaſt to weſt, aſtoniſhes them leſs than a ſmall fire, which they are able to make greater or leſs: ſeeing matter in a much more abſtract manner than we, they are leſs indiſpoſed to believe that it thinks.

A man who has ſeen but a day or two muſt, among a blind people, either be ſilent, or be looked upon as brain-ſick. He would be every day acquainting them with ſome new myſtery, which would be ſuch only

only to them, and thus free-thinkers would oppoſe it tooth and nail. Might not the champions of religion greatly avail themſelves of ſuch a ſtubborn infidelity, which, however juſt in ſome reſpects, is yet ſo very ill grounded? Be pleaſed only to dwell a little upon this ſuppoſition. It will bring to your mind, under a botrowed imagery, the hiſtory and perſecutions of thoſe whoſe misfortune it has been to find out truth in an age of darkneſs, and who imprudently made it their buſineſs to ſpread it among their blind cotemporaries; and their moſt envenomed enemies were thoſe, who, from their claſs and education, one would have thought leaſt remote from ſuch opinions.

So much for the morality and metaphyſics of the blind: I proceed to things leſs important, but more nearly connected with the end of the various obſervations every where made here ſince the Pruſſian's arrival.

Queſtion I. How can one born blind form to himſelf ideas of figures?

I believe

I believe that the motions of his body, the ſucceſſive exiſtence of his hands in ſeveral places, the continuous feeling of a body paſſing between his fingers, give him the notion of direction. In ſliding them along a thread tightly ſtretched, he has the idea of a ſtraight line; in following the bending of a ſlack thread, he gets that of a curve line: he has, by repeated experiments of the touch, a remembrance of ſenſations felt in different points. Theſe ſenſations, or points, he is able to combine, and form figures by them. A ſtraight line is to a blind man, who is no geometrician, only the remembrance of a ſeries of ſenſations placed in the direction of a tight thread; a curve line the remembrance of a ſeries of tactile ſenſations referred to the ſurface of ſome ſolid body, concave or convex. Study rectifies the geometrician's notions of theſe lines by the proprieties he diſcovers in them; but he who was born blind, whether he underſtands geometry, or not, refers all to his fingers ends. We combine coloured

points, he combines only palpable points; or, to ſpeak more preciſely, only ſuch tactile ſenſations which he remembers. The operations in his head have little analogy with ours; he cannot imagine, as imagination implies a coloured ground and points detached from that ground, by ſuppoſing them differing in colour from that ground: make thoſe points of the ſame colour as the ground, and they are inſtantly loſt in it, and the figure diſappears: at leaſt, that is the caſe in my imagination; and I ſuppoſe imaginations are alike. Thus, when I purpoſe to perceive in my head a ſtraight line otherwiſe than by its properties, my firſt ſtep is to ſpread in it a white canvaſs, detaching from the ground a continuous ſeries of black points in the like direction. The ſtronger the colours of the ground and points, the clearer my perception of the points. To view in my imagination a figure of a colour very nearly bordering on that of the ground, puts me to no leſs trouble than if out of myſelf and on a canvaſs.

You ſee then, Madam, that laws might be given for imagining with eaſe various objects, variouſly coloured; but ſuch laws are by no means calculated for one born blind, who not being able to colour, and conſequently not to imagine, in our way, remembers only ſuch ſenſations as are derived from the touch; and which he refers to different points, places and diſtances, and of which he forms figures. So certain is it that there is no figuring in fancy without colouring, that if little balls, to the colour and matter of which we are ſtrangers, be given us to touch in the dark, we ſhall immediately ſuppoſe them white or black, or of ſome other colour; and that if we do not annex a colour to them, we, like the blind man, ſhall have the remembrance only of little ſenſations excited at our fingers ends, and ſuch as little round bodies may occaſion. If this remembrance be very fleeting in us, if we have but little conception how one born blind fixes, recalls, and combines the ſenſations of the touch, it is owing to the cuſtom we derive

derive from our eyes, of performing every thing in our imagination with colours. It has, however, been my own caſe, under the agitation of a violent paſſion, to feel a thrilling throughout one of my hands, and the impreſſion of bodies, which it was ſome time ſince I had touched, renewed as ſtrongly as if ſtill actually under my touch: the limits of the ſenſation likewiſe preciſely correſponding with thoſe abſent bodies. Though ſenſation be of itſelf indiviſible, it takes up, if I may be allowed the term, a large ſpace, which the perſon blind from his birth can increaſe or contract by thought, enlarging or diminiſhing the part affected. Thus he compoſes points, ſurfaces, and ſolids: he will even have a ſolid large as the terraqueous globe, by ſuppoſing his fingers ends as large as the globe, and every where in length, breadth, and depth, taken up by the ſenſation.

I do not know any thing which better demonſtrates the reality of internal ſenſation, than this faculty, ſo weak in us, but

ſo ſtrong in thoſe who are born blind, of feeling or calling to mind the ſenſation of bodies, even when abſent, and no longer acting on us. We cannot bring one born blind to underſtand how imagination exhibits abſent objects to us as if preſent; but we eaſily perceive in us the ſame faculty of feeling at the fingers ends a body when no longer there, as in one born blind. In order to this, ſqueeze your fore-finger againſt your thumb, ſhut your eyes, ſpread your fingers, and immediately after they are ſeparated, look into yourſelf, and tell me, whether the ſenſation does not laſt a conſiderable time after the compreſſion has ceaſed? whether if, during the compreſſion, your ſoul appears to you to be rather more in your head than at your fingers ends? and whether this compreſſion does not, by the ſpace which the ſenſation fills, give you the idea of a ſurface? We diſtinguiſh the preſence of beings out of us, from the imagery of them in our imagination, only through the force or weakneſs of the impreſſion.

So

So he, who is born blind, diſcerns the ſenſation from the real preſence of an object at his fingers ends, only by the force or weakneſs of that very ſenſation. Should a philoſopher, who has been blind and deaf from his birth, ever make a man in imitation of that of Deſcartes, I dare affirm, Madam, that he will place the ſoul at the fingers ends; as from thence deriving his principal ſenſations, and all his lights. And who will put him in mind, that his head is the reſidence of his thoughts? If the labours of imagination impair our brain, it is becauſe our effort in imagining is pretty ſimilar to that which we exert in perceiving very near or very ſmall objects. But it will not be ſo with him who has been blind and deaf from his birth: the ſenſations which he has derived from the touch will be, as it were, the mould of all his ideas; and I ſhould not be ſurprized that, after a deep and cloſe meditation, his finger ſhould be as much tired as our head. It would give me no apprehenſion, were a philoſopher to object

to him, that the nerves are the cauſes of our ſenſations, and that all nerves have their origin in the brain. Were theſe two propoſitions fully demonſtrated, which is very far from being the caſe, eſpecially the former, an expoſition of all the dreams of naturaliſts on this head, would be ſufficient to confirm him in his opinion.

But if the imagination of a blind perſon be no more than the faculty of calling to mind, and combining ſenſations of palpable points; and that of a man who ſees, the faculty of combining and calling to mind viſible or coloured points: the perſon born blind conſequently perceives things in a much more abſtract manner than we; and in queſtions merely ſpeculative, he is, perhaps, leſs liable to be deceived. For abſtraction is only ſeparating the ſenſible qualities of bodies, either from one another, or from the body itſelf in which they are inherent; and from this being wrong or improper, ſprings error, wrong in metaphyſical queſtions, and improper in phyſico-mathematical queſtions.

tions. A way, in which one can ſcarce avoid being miſtaken in metaphyſics, is not ſufficiently ſimplifying the objects under inveſtigation; and an infallible ſecret for coming to falſe concluſions in phyſico-mathematics, is to ſuppoſe them leſs compounded than they are.

There is a kind of abſtraction, of which ſo very few are capable, that it ſeems reſerved to pure intelligences: the reducing every thing to numerical unities. It muſt be allowed, that the reſults of this geometry would be very exact, and its formulas very general, there being no objects either actually exiſting or poſſible, which theſe ſimple unities could not repreſent, by points, lines, ſurfaces, ſolids, thoughts, ideas, ſenſations, &c. and, if this ſhould prove to be the foundation of Pythagoras's doctrine, he might be ſaid to have failed in his plan, his mode of philoſophizing being too much above us, and too near that of the Supreme Being, who, according to the ingenious expreſſion of

an Engliſh geometrician, is perpetually geometriſing in the univerſe.

Unity, pure and ſimple, is too vague and general a ſymbol for us. Our ſenſes bring us back to ſigns more analogous to the extent of our intellects, and the conformation of our organs. We have even brought thoſe ſigns to be in common among us, and to ſerve, as it were, for the ſtaple, in the mutual commerce of our ideas: ſome we have appointed for the eye, as characters; ſome for the ear, as articulate ſounds; but for the touch we have none, though there is a proper way of ſpeaking to that ſenſe, and getting anſwers from it. The want of this language precludes all converſation between us and thoſe who are born deaf, blind, and dumb. They grow up, but ſtill in a ſtate of imbecility; whereas they might, perhaps, acquire ideas, were they, from their childhood, trained in a fixed, determinate, conſtant, and uniform manner to underſtand us: in a word, by tracing on their hand the ſame characters, which we

we delineate on paper, with the ſame ſignification unalterably annexed to them.

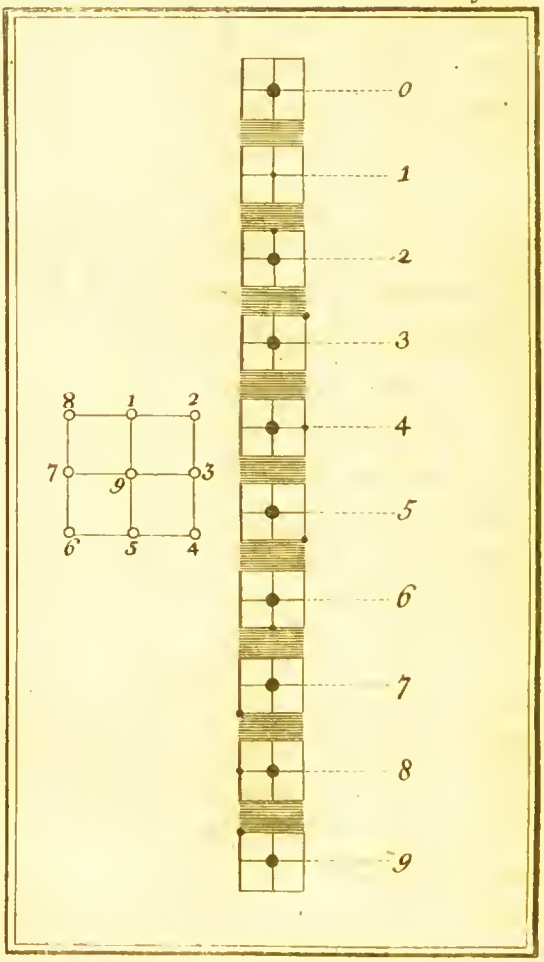
Now, Madam, does not this language appear to you as convenient as another; and is it not even ready invented?- And would you take upon you to affirm, that you never have been brought to underſtand any thing in the like manner? All that remains then is to fix it, and make a grammar and dictionaries of it, ſhould the expreſſion, by the common characters of writing, be thought too ſlow for this purpoſe.

There are three avenues for knowledge; but one, from the want of ſigns, is kept barricaded: had the two others been neglected, we ſhould be little better than brutes; as the touch underſtands only by compreſſion, ſo would it have been the only means of ſpeaking to the ear. Madam, it is only the want of one ſenſe, can make us thoroughly acquainted with the advantages of the ſymbols, appointed for thoſe which we enjoy; and what a conſolation would it be to thoſe, whoſe misfor-

tune it is to be deaf, blind, and dumb, or who ſhould loſe thoſe three ſenſes by any accident, were there a clear and preciſe language for the touch.

It is much ſhorter to uſe ſymbols ready invented, than to invent them, which yet muſt be done when taken unprepared. What an advantage would it not have been for Saunderſon, to find in his ſixth year a tangible arithmetic ready to his hands, inſtead of being put to contrive one when he was twenty-five. This Saunderſon, Madam, is another blind man, with whom it will not be foreign from my purpoſe to make you acquainted. Wonderful things, indeed, are told of him; and yet there is not one to which, from his improvements in literature, and his ſkill in mathematical ſciences, we may not ſafely give credit.

The ſame machine ſerved him for algebraical calculations, and for the deſcription of rectilineal figures. You would like to have this explained to you, did it come within your underſtanding; and now you ſhall ſee that it ſuppoſes no farther know-


0
1
2
3
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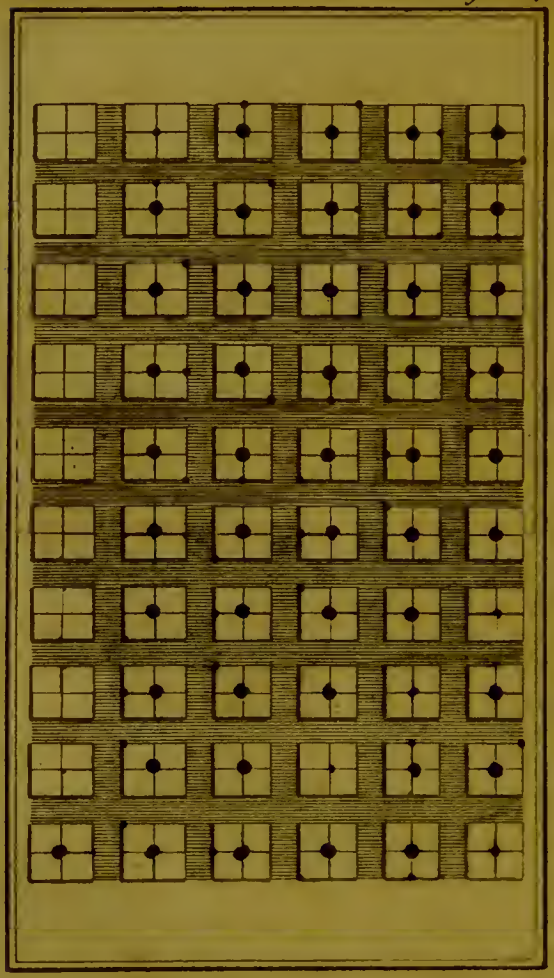
knowledge than what you are miſtreſs of, and that it would be very uſeful to you, ſhould you ever take it into your head to work long calculations *by feeling*.

Suppoſe a ſquare, as Plate II. Divide it into four equal parts by perpendicular lines at the ſides, ſo as to form the nine points, 1, 2, 3, 4, 5, 6, 7, 8, 9. In this ſquare are nine holes, capable of admitting two kinds of pins, all of the ſame length and bigneſs, except the heads of ſome being a little bigger than others.

The large headed pins were never placed but in the center of the ſquare; and the ſmall headed always on the ſides, except only in the ſingle caſe of a nought, and this was marked by a large headed pin placed in the center of the little ſquare, without any other pin on the ſides. The cypher 1, was repreſented by a ſmall headed pin in the center of the ſquare, without any other pin on the ſides. Cypher 2, by a large headed pin placed in the center of the ſquare, and a ſmall headed pin placed on one of the ſides at

point 1. Cypher 3, by a large headed pin placed in the center of the ſquare, and a ſmall headed pin placed on one of the ſides at point 2. Cypher 4, by a large headed pin placed in the center of the ſquare, and by a ſmall headed pin placed on one of the ſides at point 3. Cypher 5, by a large headed pin in the center of the ſquare, and a ſmall headed one in one of the ſides at point 4. Cypher 6, by a large headed pin in the center of the ſquare, and a ſmall headed pin on one of the ſides at point 5. Cypher 7, by a large headed pin placed in the center of the ſquare, and a ſmall headed pin placed on one of the ſides at point 6. Cypher 8, by a large headed pin placed in the center of the ſquare, and a ſmall headed pin placed on one of the ſides at point 7. Cypher 9, by a large headed pin placed in the center of the ſquare, and a ſmall headed pin placed on one of the ſides of the ſquare at point 8.

Here are ten different expreſſions for the touch, each anſwering to one of our ten arith-



arithmetical characters. Now fancy a table as large as you pleaſe; divide it into little ſquares horizontally diſpoſed, and ſeparated one from another at the ſame diſtance, as in Plate III. and this gives you Saunderſon's machine.

You readily conceive, that there are no numbers which may not be written on that table; and, conſequently, no arithmetical operation but what may be performed by it.

Let it be propoſed, for inſtance, to find the ſum of the nine following numbers.

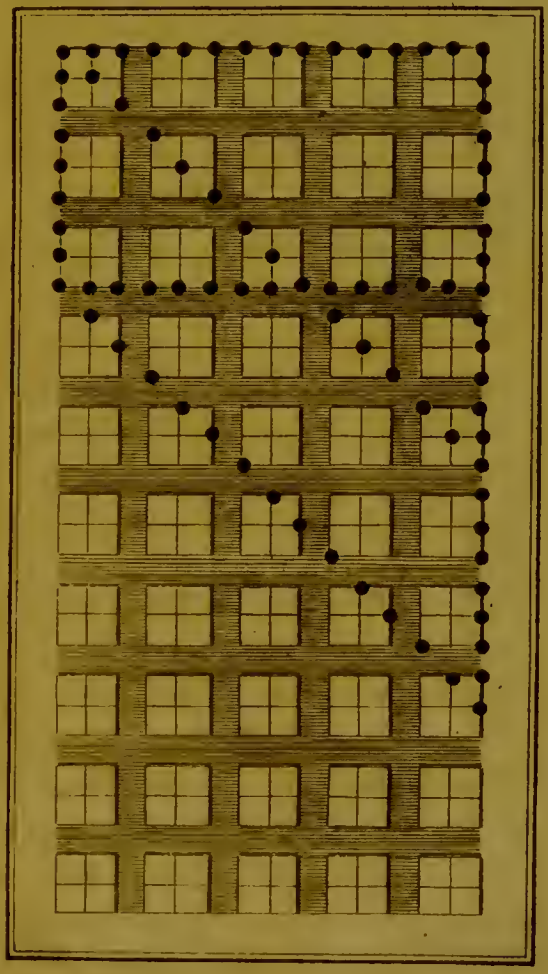
1	2	3	4	5
2	3	4	5	6
3	4	5	6	7
4	5	6	7	8
5	6	7	8	9
6	7	8	9	0
7	8	9	0	1
8	9	0	1	2
9	0	1	2	3

I write them on the table as they are named to me. The firſt cypher at the left

left of the firſt number, on the firſt ſquare to the left of the firſt line; the ſecond cypher at the left of the firſt number, on the ſecond ſquare, at the left of the ſame line; and ſo on. The ſecond number I place on the ſecond row of ſquares, the units under units, the tens under tens, &c.

I place the third number on the third row of ſquares, and ſo on, as you ſee, Plate III. Then, with my fingers going over every vertical row from the top to the bottom, beginning by that which is moſt to my left, I add up the numbers expreſſed in that row, writing the ſurplus of the tens at the end of the column. I go on to the ſecond column, proceeding towards the left, which I work in the ſame way. From that to the third; and thus ſucceſſively go through my addition.

How the ſame table ſerved him for demonſtrating the properties of rectilineal figures was thus: ſuppoſing he was to demonſtrate, that parallelograms of the like baſe and height have equal ſurfaces; he placed his pins as you ſee, Plate IV. annexing



nexing names to the angular points, and performed the demonſtrations with his fingers.

Had Saunderſon made uſe of only large headed pins to denote the limits of his figures, he could place round them ſmall headed pins diſpoſed in nine different manners, all quite plain and familiar to him; ſo that he was never at a ſtand, but when the great number of angular points to be named in his demonſtration, laid him under a neceſſity of recurring to the letters of the alphabet; and how he made uſe of them, we are not informed.

All we know is, that his fingers ran over his table with ſurprizing diſpatch; entering on the longeſt calculations, breaking off, and perceiving when he was out, that he eaſily proved them, and ſo convenient was the arrangement of his table, that this operation did not take him up any thing of the time which we ſhould conceive.

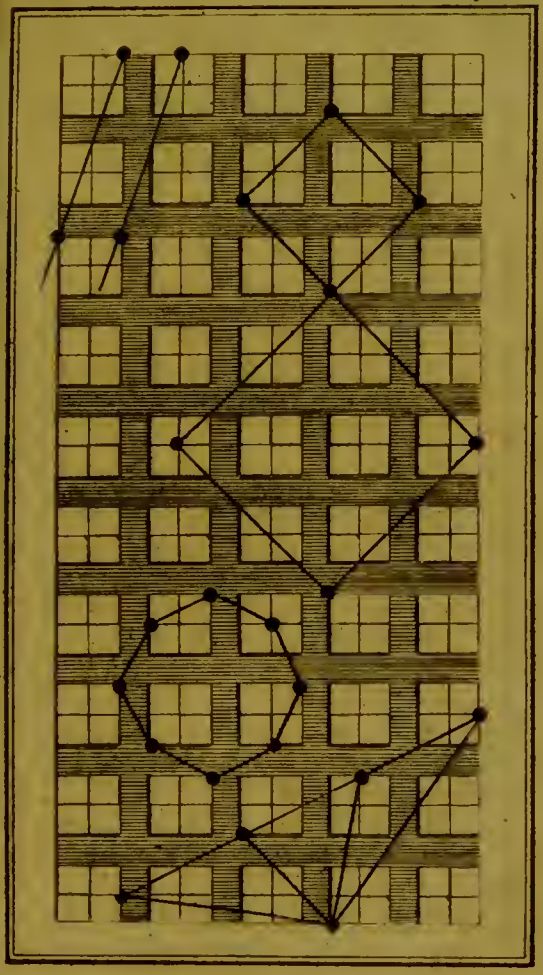
This arrangement conſiſted in placing large headed pins in the center of all the ſquares; after which, all he had to

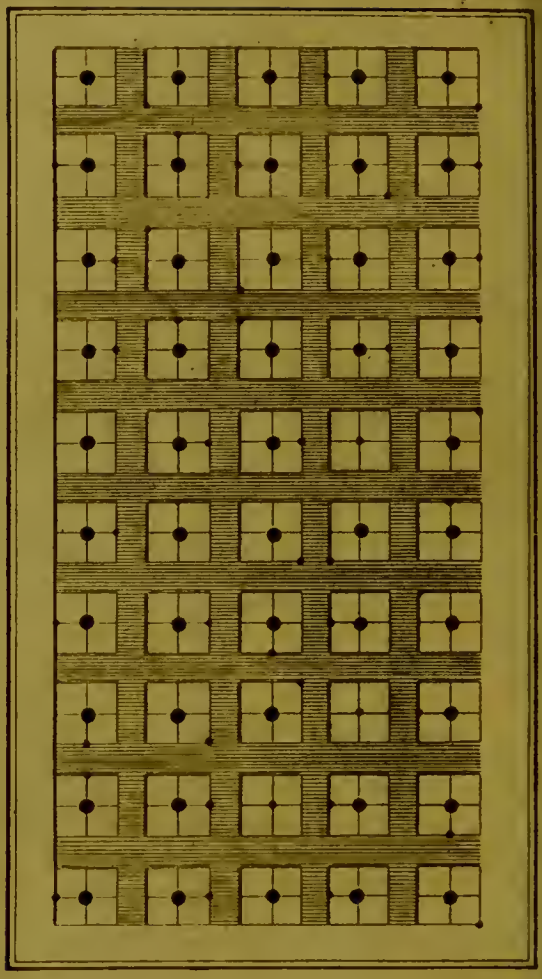
do,

do, was determining their value by the ſmall headed pins, except in the caſe of a nought. Then, inſtead of the large headed pin, he placed in the center of the ſquare, a ſmall headed one. Sometimes, inſtead of forming a whole line with his pins, he only placed them at all the angular, or interſecting points, with ſilken threads round them, which completed the limits of his figures. See Plate V.

He has left ſome other machines, which made the ſtudy of geometry eaſier to him. His particular way of uſing them is not known; and, perhaps, the finding it out would require more ſagacity than to ſolve a problem of integral calculation. I wiſh ſome geometrician would find out what uſe he made of four ſolid pieces of wood in the form of rectangular parallelopipedes, each eleven inches in length, to a breadth of five and a half, and little more than half an inch in thickneſs, with the two thick oppoſite ſurfaces divided into ſmall ſquares, like that of the abacus, before deſcribed, with this difference, that they were perfo-

rated





rated only in ſome places where the pins were thruſt in up to the head. Every ſurface repreſented nine ſmall arithmetical tables, each of ten numbers; and each of thoſe ten numbers was compoſed of ten cyphers. Plate VI. exhibits one of theſe little tables, with its numbers.

9	4	0	8	4
2	4	1	8	6
4	1	7	9	2
5	4	2	8	4
6	3	9	8	6
7	1	8	8	0
7	8	5	6	8
8	4	3	5	8
8	9	4	6	4
9	4	0	3	0

He wrote *The Elements of Geometry*, a very complete work in its kind, and which bears no other marks of his blindneſs, than the ſingularity of ſome demonſtrations, which a man, with his eyes, would perhaps not have hit on. He firſt found out

out the diviſion of the cube into ſix equal pyramids, with their ſummits in the center of the cube, and their baſes each of its faces. It is uſed in a very plain demonſtration, to ſhow that every pyramid is the third of a priſm of the ſame baſe and height.

His own taſte led him to the ſtudy of the mathematics, and the ſmallneſs of his fortune, but chiefly the encouragement of his friends, put him on holding public lectures. They made no queſtion of his ſucceeding beyond his hopes, by his wonderful facility in making himſelf underſtood. Saunderſon, indeed, uſed to ſpeak to his pupils as if they had loſt their ſight; but that blind man, who ſpeaks ſo as to be clearly underſtood by the blind, muſt go a great way with thoſe who have their ſight: it is a teleſcope the more. They who have written his life ſay, that he abounded in happy expreſſions; and that is very probable. But, perhaps, you will aſk me, what do you mean by happy expreſſions? I anſwer, Madam, that they

are

are ſuch which are proper to one ſenſe, as to the touch, and, at the ſame time, metaphorical to another ſenſe, as the ſight; a circumſtance, from which the perſon ſpoken to receives a double light, the real and direct light of the expreſſion, and the reflected light of the metaphor. It is evident, that on theſe occaſions, Saunderſon underſtood himſelf only by halves, as perceiving only half the ideas annexed to the terms he uſed. But who is not now and then in the like caſe? many a ſmart jeſt ſhall come from idiots, and perſons of the beſt ſenſe drop a ſilly thing without either being aware of it.

I have obſerved the want of words produce the like effect in foreigners, who, in our language, are obliged to ſay every thing in very few words, ſome of which they unknowingly place very happily. But every language being to writers of a lively fancy deficient in fit words, they are in the ſame caſe as foreigners of wit; the ſituations invented by them, the delicate gradations

they perceive in characters, the natural pictures which they draw, are continually leading them from the common ways of ſpeaking into terms and phraſes, which never fail to charm, when neither obſcure nor affected; and theſe faults are dealt with according to the reader's own wit, and his little acquaintance with the language. Hence it is that, of all French writers, M. de M—— is beſt liked by the Engliſh; and Tacitus, of all the claſſics, bears the bell among *thinkers:* they do not attend to the licences of the ſtyle, it is only the truth of the expreſſion which ſtrikes them.

Saunderſon was profeſſor of mathematics at the univerſity of Cambridge. He read lectures on optics, the nature of light and colours; he explained the theory of viſion, the effects of glaſſes, the phænomena of the rainbow, and ſeveral other points relating to ſight, and its organ.

The marvellous of theſe things, Madam, will be found conſiderably to abate, on your taking into conſideration, that there

there are three things to be diſtinguiſhed in every phyſico-geometrical queſtion; the phænomenon to be explained, the geometrician's ſuppoſitions, and the calculation reſulting from the ſuppoſitions. Now, it is manifeſt, that to a blind perſon, how great ſoever his penetration be, the phænomena of light and of colours are unknown. The ſuppoſitions he will underſtand, as all of them relate to palpable cauſes; but the geometer's reaſon for preferring them to others, will be out of his verge, as in order to that, he muſt be able to compare the ſuppoſitions themſelves with the phænomena: therefore, the blind man takes the ſuppoſitions for what they are given him; a ray of light for an elaſtic and fine thread, or for a ſeries of minute bodies ſtriking our eyes with incredible velocity; and he calculates accordingly. The tranſition from phyſics to geometry is now got over, and the queſtion becomes ſimply mathematical.

But what are we to think of the reſults of the calculation? 1. That the coming at them;

them is ſometimes extremely difficult, and that it would be to little purpoſe, that a naturaliſt could form the moſt plauſible hypotheſes, were he not able to verify them by geometry: accordingly, the greateſt natural philoſophers, as Galileo, Deſcartes, and Newton, were great geometricians. 2. That theſe reſults are more or leſs certain, as the hypotheſes on which they are built, are more or leſs complicated. When the calculation is founded on a ſimple hypotheſis, the concluſions acquire the force of geometrical demonſtrations. When the ſuppoſitions are multifarious, the probability of each hypotheſis being true diminiſhes in proportion to the number of the hypotheſes; but, on the other hand, increaſes from the little probability, that ſo many falſe hypotheſes would exactly correct each other, and produce a reſult confirmed by the phænomena. This would be like an addition, the reſult of which was right, though the partial ſum of the numbers added had been all miſcounted. The poſſibility of ſuch an opera-

operation cannot be denied; but, at the ſame time, you ſee, that it would very ſeldom prove ſo. The more numbers are to be added, the greater the probability of a miſtake in the addition of each; but this probability is likewiſe leſſened, if the reſult of the operation be right: ſo that there is a number of hypotheſes, the certainty reſulting from which would be the leaſt poſſible. If I make A, plus B, plus C, equal to 50, am I to conclude from 50 being the real quantity of the phænomena that the ſuppoſitions repreſented by the letters A, B, C, are true, there being numberleſs ways of taking from one of thoſe two letters, and adding to the other, and 50 to prove always the reſult? But the caſe of three combined hypotheſes is, perhaps, one of the moſt disfavourable.

One advantage of calculation, which I muſt not omit, is, that the contrariety found between the reſult and the phænomenon excludes falſe hypotheſes. A naturaliſt, to find the curve formed by a ray of light in the atmoſphere, is obliged to regulate

regulate himſelf by the denſity of the ſtrata of the air, the law of refraction, the nature and figure of the luminous corpuſcle, and, perhaps, by other eſſential elements which he does not bring into account, either as voluntarily neglecting them, or being unknown to him. At length he determines the curvature of the ray. If it be otherwiſe in nature, than his calculation makes it, his ſuppoſitions are deficient or falſe; if the determination agrees with the natural curvature of the ray, it follows either, that ſome ſuppoſitions have corrected others, or that they are all exact: but which of the two, he knows not; yet, that is the certitude to which he can attain.

I have carefully peruſed Saunderſon's *Elements of Algebra*, in hopes of meeting with what I was deſirous of knowing from thoſe who familiarly converſed with him, and who have made us acquainted with ſome particulars of his life; but my curioſity has been diſappointed, and I thought that elements of geometry from him would have

have been a work both more ſingular in itſelf, and much more uſeful to us. We ſhould there have been let into his definitions of point, line, ſurface, ſolid, angle, interſections of lines and planes, in which I make no queſtion but he would have proceeded on principles of very abſtract metaphyſics, and near a-kin to that of the idealiſts. Idealiſts, Madam, are thoſe philoſophers who, being conſcious only of their exiſtence and a ſucceſſion of internal ſenſations, admit nothing elſe. A ſyſtem of ſuch extravagancy, that I ſhould think it muſt have been the offspring of blindneſs itſelf; and yet, to the diſgrace of the human mind and of philoſophy, is the moſt difficult to combat, though the moſt abſurd. Dr. Berkeley, biſhop of Cloine, in Ireland, has ſet it forth with great candour and perſpicuity, in three dialogues. It were to be wiſhed, that the author of the *Eſſay on our Knowledge*, would take this work into examination; he would there find matter for uſeful, agreeable, and ingenious obſervations; for

ſuch as, in a word, no perſon has a better talent. Idealiſm deſerves very well to be reported to him; and this hypotheſis is as a double incentive for him, its ſingularity, and much more the difficulty of refuting its principles, they being preciſely the ſame as thoſe of Berkeley. According to both, and according to reaſon, the terms, eſſence, matter, ſubſtance, agent, &c. of themſelves, convey very little light to the mind. Beſides, as the author of *The Eſſay on the Origin of Human Knowledge* judiciouſly obſerves, whether we aſcend up to the heavens, or go down into the abyſſes of the earth, we never go out of ourſelves, and what we perceive is only our own thoughts: now this is the very reſult of Berkeley's firſt dialogue, and the foundation of his whole ſyſtem. Would it not highly delight you, Madam, to ſee two enemies engaged, whoſe weapons are ſo much alike? If either got the better, it muſt be he who ſhould manage them with the greater dexterity; and the author of *The Eſſay on the Origin of Human Knowledge*

ledge has lately, in a treatiſe on ſyſtems, given freſh proofs of his adroitneſs, and how much he is to be redoubted by ſyſtematics.

Here, you will ſay, this is quite loſing ſight of the blind. True, Madam; but you muſt be ſo good as to allow me all theſe digreſſions. I promiſed you a converſation, and, without this indulgence, I cannot keep my word.

I have peruſed, with the utmoſt ſtretch of my attention, what Saunderſon has ſaid concerning infinitude: and I can aſſure you, that he had ſuch very juſt and very clear ideas on this head, that, in his account, moſt of our infinitarians would have been looked on but as blind. You yourſelf ſhall be judge: though this matter be ſomewhat difficult, and a little beyond your mathematical knowledge, I truſt to bring it within your compaſs, and initiate you into this infiniteſimal logic.

This celebrated blind man proves that touch, when improved by exerciſe, may become more preciſe than ſight; for, in

handling a ſeries of medals, he could diſtinguiſh the genuine from the ſpurious *, though the imitation was ſuch as might have deceived a clear-ſighted connoiſſeur; and he judged of the exactneſs of a mathematical inſtrument, by drawing his fingers ends along its diviſions. Theſe are certainly things of another kind of difficulty, than forming a judgment by the touch of the likeneſs of a buſt to the perſon it repreſents. This ſhews that a blind people might have ſculptors, and put ſtatues to the ſame uſe as among us, to perpetuate the memory of glorious actions, and of perſons dear to them; and, in my opinion, feeling ſuch ſtatues would give them a more lively pleaſure than we have in ſeeing them. What a delight to a paſſionate lover, in gently drawing his hand over beauties which he would know again, when illuſion, which would act more ſtrongly on the blind than in thoſe who

* The roughneſs of thoſe new caſt, is thought to have aſſiſted him in this diſtinction.

ſee,

ſee, ſhould come to reanimate them; but likewiſe, the more pleaſure ſuch remembrance gave him, the leſs, perhaps, would his grief be for the loſs of the original.

Saunderſon, like the Puiſaux blind man, was affected on the leaſt alteration in the atmoſphere, and ſenſible, eſpecially in calm weather, of any objects being near him. It is related of him, that being preſent at the making ſome aſtronomical obſervations in a garden, the clouds, which now and then intercepted the ſun's diſk, at the ſame time occaſioned ſuch a change in the action of the rays on his face, as ſignified to him the intervals which favoured or impeded the obſervations. You may, perhaps, think, that there was ſome agitation in his eyes, which apprized him of the preſence of light, but not of that of objects. So I ſhould have thought too, were it not certain that Saunderſon was not only blind, but without the very organ of ſight.

Thus Saunderſon ſaw, by means of a pellicle; and of ſuch an exquiſite ſenſibility was this tegument, that a little practice would have brought him to have known an acquaintance, by having his portrait delineated on his hand, and that, by the ſucceſſion of the ſenſations excited by the pencil, he would have confidently ſaid, "Oh! this is Mr. ſuch a-"one." Thus the blind have likewiſe a painting, in which their own ſkin ſerves for the canvas. Theſe ideas are ſo far from the chimera, that I make no queſtion, were ſomebody to draw on your hand Mr. ———'s little mouth, you would immediately know it; yet, you muſt allow, that this would be much eaſier to one born blind, than to you, though ſo accuſtomed to ſee it and to think it ſo wonderful pretty. For, your deciſion implies two or three circumſtances; the compariſon of the delineation made on your hand, with the picture of it on the ground of your eye; the remembrance of the manner in which we are affected by things felt,

and

and of that with which we are affected by things which we have only ſeen and admired; laſtly, the application of theſe data to the deſigner's queſtion, who aſks you, with the point of his pencil on the ſkin of your hand, "Whoſe mouth is this which "I am drawing?" Whereas the ſum of the ſenſations excited by a mouth on the hand of a blind man, is the ſame as the ſum of the ſucceſſive ſenſations excited by a deſigner's pencil.

To this account of the Puiſaux blind man and Saunderſon, may be added Didymus of Alexandria, Euſebius the Aſiatic, and Nicaiſe of Mechlin, with ſome others, who appeared ſo ſuperior to other men, though with one ſenſe leſs, that the poets might, without exaggeration, have feigned the gods to have deprived them of it from a jealouſy leſt mortals ſhould equal them. For Tireſius, who had ſeen into the ſecrets of the gods, and had the gift of prediction, what was he but a blind philoſopher, whoſe memory has been preſerved by fable? But we will keep to the won-

derful Saunderſon, and follow this extraordinary perſon to his grave.

When drawing near to his end, Mr. Jervis Holmes, a clergyman of great abilities, was deſired to attend him. They had a converſation together on the exiſtence of God, ſome fragments of which are remaining, which I will tranſlate, as well as I can, it being not a little curious.

The clergyman began with haranguing on the wonders of nature. "Ah, Sir," ſaid the blind philoſopher to him, "what "is all that grand ſpectacle to me? I have "been condemned to ſpend my life in "darkneſs: you mention wonders quite "out of my underſtanding, and which "are proofs only to you, and thoſe who, "like you, have their ſight. If you "would have me believe in God, you "muſt make me feel him."

"Sir," replied the clergyman, very appoſitely, "feel yourſelf, and you will "meet with the Deity in the admirable "mechaniſm of your organs."

"Mr.

" Mr. Holmes," replied Saunderſon, " I muſt repeat it, all that may be very " fine to you, yet is not ſo to me; but " were the animal mechaniſm as perfect " as you make it, and I believe it to be " ſo, for you are a worthy man, and " would ſcorn to impoſe on me; what " relation is there between ſuch mecha- " niſm and a ſupremely intelligent Being? " If it amazes you, it is, perhaps, from " your being uſed to call every thing you " cannot directly comprehend, a wonder. " I myſelf have ſo often been an object of " wonder to the world, that I have but a " very ſlender opinion of its wonders. " People have come from the fartheſt " part of England to ſee me, not con- " ceiving how I could perform geometri- " cal operations. You muſt allow thoſe " people not to have been very exact in " their notions of the poſſibility of things. " If a phænomenon appears to us above " human comprehenſion, we immediately " ſay it is the work of God; nothing leſs " will ſatisfy our vanity. Would not a

" little leſs pride, and a little more philo-
" ſophy, do better in our converſations?
" If in nature we meet with a difficult
" knot, let us leave it as it is, and not
" call in to cut it the hand of a being which
" afterwards becomes a freſh knot more
" difficult for us to untie than the former.
" Aſk an Indian how the world remains
" ſuſpended in the air? He will anſwer,
" that it is carried on the back of an ele-
" phant. And on what does the elephant
" bear? On a tortoiſe. And what ſup-
" ports the tortoiſe?—You pity the In-
" dian, and one might ſay to yourſelf as to
" him, My good friend Holmes, acknow-
" ledge your ignorance, and forgive me
" the elephant and the tortoiſe."

Here Saunderſon made a little pauſe, probably expecting an anſwer from the clergyman; but on which ſide is a blind man to be attacked! Mr. Holmes availed himſelf of Saunderſon's good opinion of his probity, and of the abilities of Newton, Leibnitz, Clerk, and ſome others of his countrymen, poſſibly the firſt geniuſſes

of

the world, who all had been ſtricken with the wonders of nature, and acknowledged an intelligent being as its author. This was undoubtedly the moſt forcible objection which the clergyman could offer to Saunderſon. Accordingly the good blind man allowed that it would be ſomething preſumptuous to deny what ſuch a man as Newton had acquieſced in: yet he repreſented to the clergyman, that Newton's teſtimony was not of that weight to him, as that of all nature muſt be to Newton; and that it was on God's word that Newton believed; whereas he was reduced to believe on Newton's word.

"Conſider, Mr. Holmes," added he, "what a confidence I muſt have in your "word and in Newton's. Though I ſee "nothing, I admit that there is in every "thing an admirable order; but I pro-"miſe myſelf, that you will not require "any thing farther. Concerning the pre-"ſent ſtate of the univerſe, I yield to "you; and in return, you will allow me

" the liberty of thinking as I pleaſe on its
" ancient and primitive ſtate, with relation
" to which you are as blind as myſelf. In
" this you will have no witneſſes to bring
" againſt me, and your eyes are out of
" the queſtion. You are therefore wel-
" come to imagine, that the order which
" you ſo highly admire has ever ſub-
" ſiſted; but allow me to think that it is
" otherwiſe, and that if we recurred to
" the origin of things and times, and
" that we perceived matter actuated, and
" the chaos unfolding itſelf, we ſhould
" meet with a multitude of informous
" for a few well-organized beings. If I
" have nothing to object to you con-
" cerning the preſent condition of things,
" I may at leaſt queſtion you concerning
" their paſt conditions. I may, for in-
" ſtance, aſk you who told you, who told
" Leibnitz, Clerk, and Newton, that at
" the primordial formation of animals,
" ſome were not without a head, others
" without legs? I might affirm that
" ſome had no ſtomach, others no bowels;

" that ſome ſpecies, which, having a ſto-
" mach, a palate and teeth, ſeemed like-
" ly to laſt, have failed through ſome
" defect in the heart or the lungs. That
" monſters have ſucceſſively deſtroyed
" each other, that all the faulty combi-
" nations of matter have diſappeared,
" only thoſe remaining, the mechaniſm
" of which was no important contradic-
" tion, and which could ſubſiſt and per-
" petuate themſelves.

" On this ſuppoſition, if in the firſt man
" the larynx had been cloſed, if he had
" wanted proper aliments, if the genera-
" tive parts had been defectuous, if he had
" not met with his mate, or had mingled
" within another ſpecies, pray, Mr.
" Holmes, where would the human ſpe-
" cies have been? It would have been
" involved in the general depuration of
" the univerſe, and that haughty being
" called man, thus diſſolved and ſcat-
" tered among the moleculæ of matter,
" would have remained perhaps for ever
" in the claſs of poſſibility.

" Had

" Had there never been any informous " beings, you would not fail affirming, " that there never will be any, and that " I run into chimerical hypotheſes; but," continued Saunderſon, " amidſt all this " ſo perfect order, monſtrous productions " come forth now and then." Then facing the miniſter, he ſaid, " Behold " me, Mr. Holmes, I have no eyes. " What had either you or I done to God, " that one ſhould have that organ, and " the other be without it."

Saunderſon pronounced theſe words with a countenance ſo earneſt and ſo expreſſive of deep concern, that the clergyman and the reſt of the company could not forbear participating in his grief, even to tears. The blind man perceiving it, ſaid to the clergyman, " Mr. Holmes, " the goodneſs of your heart was well " known to me, and I am very ſenſible " of this freſh proof of it in theſe my " laſt moments; but if you have any con- " cern for me, dō not grudge me the " com-

" comfort of dying without having ever " cauſed affliction to any one."

Then, with ſomething of a more reſolute voice, he continued, " It is there- " fore my conjecture, that at the begin- " ning, when the fermentation of mat- " ter diſcloſed the univerſe, ſuch as I " were very common. But why ſhould " not I affirm of worlds what I believe " of animals? How many maimed ab- " ortive worlds have been deſtroyed, or " perhaps are continually amended and " deſtroyed, in thoſe remote ſpaces which " I cannot reach, and you do not ſee; but " in which motion continues and will con- " tinue to combine maſſes, till brought " to ſome proper diſpoſition for duration? " Come, philoſophers, accompany me then " to the confines of that univerſe, beyond " that point within which I touch, and " you ſee organized beings; range that " new ocean, and amidſt its irregular agi- " tations ſeek ſome veſtiges of that in- " telligent being, whoſe wiſdom you here " ſo much admire.

" But

" But there's no need of taking you out
" of your element. Pray, Mr. Holmes,
" what is this world? Is it not a com-
" pound ſubject to revolutions all indi-
" cating a continual verging to deſtruc-
" tion; a rapid ſucceſſion of beings fol-
" lowing and propelling one another,
" and diſappearing; a tranſient ſymetry,
" a momentary order? I was juſt now
" taxing you with eſtimating the perfec-
" tion of things by your capacity; and
" here I may find fault with you for mea-
" ſuring the duration of them by that of
" your life: you judge of the world's
" ſucceſſive exiſtence as the ephemeron-
" fly of yours. This world is eternal to
" you, juſt as you are eternal to the being
" who lives but an inſtant; and ſtill the
" inſect ſhews more reaſon than you.
" What prodigious ſeries of ephemerons,
" what immenſe traditions, bear witneſs
" to your eternity? We ſhall all, how-
" ever, paſs away, without a poſſibility
" of denoting the real extent which we
" took up, or the preciſe time of our du-
" ration.

" ration. Time, matter, and ſpace, are " perhaps but a point."

During this converſation, Saunderſon became moved ſomething beyond what his condition would bear, that he was ſeized with a delirium, which laſted for ſome hours, and on coming to himſelf he only cried out, " O thou God of " Clark and Newton, have mercy on me," and expired*.

Thus died Saunderſon. You ſee, Madam, that all the reaſonings which he objected to the clergyman were not able ſo much as to fix a blind man. What a ſhame for thoſe who ſee, and have no better reaſons than he, and to whom the wonderful ſpectacle of nature, from the riſing of the ſun to the ſetting of the ſmalleſt ſtars, declares the exiſtence and glory of its author. They have eyes, which Saunderſon wanted; but Saunderſon

* The profeſſor, however, had, according to his life prefixed to his *Algebra*, been ſo far brought to a ſenſe of Chriſtianity, that a time had been appointed for his receiving the ſacrament.

ſon had a purity of manners, a candour and openneſs, which they have not. Accordingly, they live as if blind, and Saunderſon died as if he had had his ſight. The voice of nature made itſelf ſufficiently underſtood by him, through his remaining organs; and this indeed adds to the force of his teſtimony againſt thoſe who obſtinately ſhut their eyes and ears. I would fain aſk, whether the darkneſs of paganiſm did not ſhroud the true God from Socrates, more than did the loſs of ſight, and of the grand ſpectacle of nature, from Saunderſon?

I am very ſorry, Madam, that, both for your ſatisfaction and mine, other intereſting particulars of this celebrated blind man have not been tranſmitted to us. His anſwers would perhaps have afforded more light than all the experiments propoſed to be made. Thoſe about him muſt have had very little of the philoſopher in them, with exception, however, of Mr. William Inchclif, who was with Saunderſon only in his laſt hours, and has preſerved for us his

his laſt ſayings, on account of which I would adviſe all who have any acquaintance with the Engliſh to read a work printed at Dublin in 1747, under the title of *The Life and Character of Dr. Nicholas Saunderſon, late Lucaſian Profeſſor of the Mathematics in the Univerſity of Cambridge. By his Diſciple and Friend, William Inchclif, Eſq*; They will find in it a beauty, a force, and a variety, ſcarce ever parallelled, but which, with all my care, I do not preſume to think my tranſlation has preſerved.

In 1713, he married the daughter of Mr. Dickons, rector of Boxworth in Cambridgeſhire, by whom he had a ſon and daughter, ſtill living. His laſt farewel to his family is very moving. "I am going," ſaid he, "where we ſhall all go; "ſpare me your lamentations; they affect me too much; your expreſſions of "grief for me ſharpen thoſe which eſcaped "me. It is no uneaſineſs to me to leave a "world, which has been only a long deſire and one continued deprivation.

"I

" I wiſh you all happineſs; live virtu-
" ouſly; and learn in me to die quietly."
Then, taking his wife by the hand, he ſqueezed it a while between his; he turned his face towards her, as if deſirous of ſeeing her: after giving his children his bleſſing, he embraced all his family, and deſired them to withdraw, their lamentations being more uneaſy to him than the approaches of death.

England is the country of philoſophers, virtuoſi, and ſyſtem-makers; yet had it not been for Mr. Inchclif, we ſhould have known no more of the celebrated Saunderſon, than what any common man could have told us, as that he knew again ſuch places where he had once been, by the noiſe which the walls and the floor reflected, amongſt a hundred other ſuch things, all equally common to moſt blind perſons. Are Saunderſons then ſo very common in England? Does every town there produce perſons, who, without ever having their ſight, read lectures on optics?

We

We are curious of ſeeing ſight given to thoſe who were born blind; but, on farther conſideration, philoſophy, I believe, would be found rather a greater gainer by queſtioning a ſenſible blind man. We ſhould learn the ſtate of things in him; and could compare them with the ſtate of things within ourſelves; and perhaps we might from this compariſon come at the ſolution of the difficulties which make the theory of viſion and of the ſenſes ſo intricate and ſo uncertain: But I own I cannot conceive what is to be hoped for from a man who has juſt undergone a painful operation on a very tender organ, which the ſlighteſt accident diſorders, and which, when found, is known to deceive thoſe who had for a long time enjoyed its advantages. For my part, as to the theory of the ſenſes, I had much rather hear a metaphyſician, well acquainted with the principles of natural philoſophy, the elements of mathematics, and the conformation of the parts, than a man of no education, and void of learning, who has had

has had his ſight reſtored to him by the cataract-operation. I ſhould lay leſs ſtreſs on the anſwers of a perſon ſeeing for the firſt time, than on the diſcoveries of a philoſopher who had thoroughly digeſted his ſubject in the dark, or, to ſpeak practically, had put out his eyes, to be the better acquainted with viſion.

In order to give ſome certainty to experiments, the ſubject muſt at leaſt have been prepared long before, been well educated, and the better, if made a philoſopher; but even for a philoſopher to make a philoſoper, is not the work of an hour; and what will it be, if he be not one? And it is ſtill much worſe, if he conceits himſelf ſuch. The obſervations ſhould by no means be commenced till long after the operation. In order to this, the patient ought to go through his cure in the dark, till his wound be thoroughly healed, and his eyes entirely ſound. I would not have him at firſt expoſed to open day. If our own ſight is diſordered by the glare of a ſtrong light, what effect

fect will it not have on an organ which cannot but be extremely tender and ſenſible, having never yet felt any impreſſion to blunt it?

But farther, it would ſtill be a very nice point to reap any benefit even from a ſubject thus prepared, and to adapt our queſtions ſo, that he may preciſely ſay only what paſſes in himſelf. This interrogatory ſhould likewiſe be before the academy; or rather, for avoiding a ſuperfluity of ſpectators, only ſuch as deſerve that diſtinction by their knowledge in philoſophy, anatomy, *&c.* ſhould be invited to ſuch a meeting. It would be no diſparagement to the moſt profound ſcholars, or to men of the fineſt intellects. To prepare and queſtion one born blind, would not have been beneath the combined talents of Newton, Deſcartes, Locke, Leibnitz.

I ſhall conclude this letter, which, I own, is already too long, with a queſtion which was propoſed ſome time ago, and which my reflections on Saunderſon's ſingular condition have ſhewn me to have never

never been abſolutely ſolved. Suppoſe one blind from his birth, and grown up to manhood, and who has been taught to diſtinguiſh, by his touch, a cube and a globe of the ſame metal, and nearly of the ſame bigneſs, ſo that when he touches either, he can tell which is the cube, and which the globe. Again, ſuppoſe the cube and the globe put on a table, and this blind perſon is made to ſee; and the queſtion is, if by ſeeing them without touching them, he will be able to diſtinguiſh them, and tell which is the cube, and which the globe?

This queſtion was firſt propoſed by M. Molineux, who likewiſe ſet about ſolving it. The deciſion was, that the perſon would not diſtinguiſh the globe from the cube: for, ſaid he, though experience has taught him how the globe and the cube affect his touch, he does not yet know that what affects his touch in ſuch and ſuch a manner muſt affect his ſight thus or thus; nor that the ſame angle of the cube which preſſes on his hand unequally,

unequally, muſt appear to his eyes as in the cube.

Locke being conſulted, ſaid, "I am entirely of M. Molineux's mind. The blind man could not at firſt ſight be able to affirm with any certainty which was the globe and which the cube, if he only viewed them; though by handling them he might confidently name and diſtinguiſh them by the difference of their figures, his touch bringing them to his remembrance."

Concerning this queſtion, the Abbé de Condillac, whoſe *Eſſay on the Origin of Human Knowledge* you read with ſo much pleaſure and improvement, and whoſe excellent *Treatiſe on Syſtems* accompanies this letter, has a particular opinion. To lay before you the reaſons on which he bottoms, would be both needleſs, and envying you the pleaſure of reading over again that work, in which they are ſet forth in a manner ſo entertaining and yet ſo philoſophical, as forbids my diſplacing them. I ſhall only obſerve, that they all tend to demonſtrate that the perſon born blind

ſees not any thing, or ſees the ſphere and the cube as different; and that the conditions of theſe two bodies being of the ſame metal, and nearly of the ſame bigneſs, inſerted in the ſtate of the queſtion, are ſuperfluous, which cannot be diſputed; for, he might have ſaid, if there be no eſſential connection between the ſenſation of the ſight and the touch, as Meſſ. Locke and Molineux pretend, they muſt allow that a body may to the eye appear to have two feet diameter, which yet would vaniſh on being touch'd. The abbé however adds, that if the perſon born blind ſees bodies, diſcerns their figures, and ſtill heſitates what to think of them, it muſt be from metaphyſical reaſons, and thoſe not a little ſubtile, as you ſhall preſently ſee.

Thus here are two different opinions on the ſame queſtion, and between firſt-rate philoſophers. One would think, that after being canvaſſed by ſuch men as Molineux, Locke and Condillac, nothing more could be ſaid; but ſo many are the faces

faces in which the same thing may be viewed, that it is not in the least strange, if they have not drained the subject.

They who declare for the blind man's distinguishing the cube from the sphere, have set out with supposing a fact, which perhaps ought to have been examined; that is, whether a person born blind would be able to make use of his eyes immediately after being couched? All they have said is, "A person blind from his "birth, by comparing the ideas of the "sphere and cube which he has received "from the touch, with those received from "sight, will necessarily know them to be the "same; that it would be very odd for him "to say that the cube gives his sight the "idea of a sphere, and the sphere that of "a cube; that what by the touch he called "sphere and cube, he from the sight will "call cube and sphere."

But how do their antagonists argue? They have in like manner supposed, that the person born blind could see immediately after his organ's being restored.

They ſuppoſed that an eye couched for a cataract was like an arm recovered from the palſy. "This," ſay they, "feels without any previous exerciſe, and conſequently the other requires none to ſee." And they have added, "Let us allow the perſon who was born blind a little more philoſophy than you afford him; and after carrying his reaſoning where you left him, he will go on thus: But ſtill who has aſſured me, that when I have come near to thoſe bodies, and have laid my hands on them, they will not on a ſudden deceive my expectation; the cube imparting to me the ſenſation of the ſphere, and the ſphere that of the cube? Experience alone can teach me whether there be an analogy between the ſight and the touch. Theſe reports of the two ſenſes may be contradictory without my knowing it; nay, I ſhould perhaps believe what is actually before my ſight to be only a mere appearance, had I not been informed that they are the very ſame bodies

"which

" which I had touched. This indeed " ſeems to be the body which I called " cube, and this the ſphere ; but I am " not aſked about what they ſeem, but " what they are ? and that is a queſtion " which I am in no wiſe able to an- " ſwer."

This reaſoning," ſays the author of the *Eſſay on the Origin of Human Knowledge*, " would be very perplexing to him who " had been born blind; and I ſee nothing " under experience which can furniſh an " anſwer to it." The abbé, in all likelihood, means only that experience which the blind man himſelf would repeat on the bodies by a ſecond handling. You will ſoon perceive why I make this remark. That able metaphyſician might likewiſe have farther added, that in one born blind the ſuppoſing two ſenſes to be contradictory ſhould be the leſs abſurd, as he conceives that a ſpeculum makes them in reality contradictory, as I have noticed above.

The abbé proceeds to obſerve, that M. Molineux has perplexed the queſtion with ſeveral conditions, which neither obviate nor remove the difficulties metaphyſics would form in one who had been blind from his birth: this obſervation is the more juſt, the ſuppoſing the blind man acquainted with metaphyſics being not at all out of the way; as the experiment in all philoſophical queſtions ſhould be accounted to be made on a philoſopher, that is, on a perſon who, in the queſtions propoſed to him, perceives all that reaſoning and the ſtate of his organs allow him to perceive.

This, Madam, is in brief what has been ſaid pro and con on this queſtion; and you ſhall now ſee, by my examination of it, how very far they, who determined that the man born blind would ſee the figures and diſtinguiſh the bodies, were from perceiving that they were in the right, and what great reaſon they who denied it had to think that they were not in the wrong.

The

The queſtion about the man born blind being taken a little more generally than M. Molineux has propoſed it, includes two others, which we ſhall ſeparately conſider. It may be aſked, 1. Whether he who was born blind will ſee immediately after his cataracts are couched? 2. Whether, in caſe he does ſee, his ſight will be ſuch as to diſtinguiſh figures; whether, in ſeeing them, he will be able to give them, with certainty, the ſame names which he gave them by the touch; and whether he will have any demonſtration that theſe names ſuit them?

Will he who was born blind ſee immediately after the cure of the organ? They who hold the affirmative ſay, "As ſoon "as the blind man comes to the uſe of "his eyes, all the ſcene before him be- "comes painted at the bottom of his "eye. This image, as conſiſting of an "infinite number of objects, concenter- "ed within a very ſmall ſpace, is but a "confuſed heap of forms which he will "not be able to diſtinguiſh from one

" another. Both ſides are nearly agreed, " that experience alone can teach him to " judge of the diſtance of objects, and " that he is even under a neceſſity of " drawing near to them, handling them, " removing farther off from them, ap- " proaching them, and handling them a- " gain, before he is aſſured that they " are not a part of himſelf; that they " are foreign from his eſſence, and that " he is ſometimes near, and ſometimes " at a diſtance from them. And why " ſhould not experience be likewiſe ne- " ceſſary to him for perceiving them? " Without experience, he who perceives " objects for the firſt time ſhould ima- " gine, as they are going out of his " ſight, or he is going from them, that " they no longer exiſt; for it is only ex- " perience on permanent objects, and " ſuch which we find again in the ſame " place where we left them, which evi- " dences and confirms to us the continu- " ance of their exiſtence when out of our " ſight. It may be for this reaſon, that

" children

" children become ſo ſoon eaſy about
" their play-things being taken from
" them. It cannot be ſaid that they
" quickly forget them ; for ſome chil-
" dren, at the age of only two years or
" two years and a half, know a conſide-
" rable part of the words of a language,
" and they are more at a loſs to conceive
" them than retain them : now this is a
" proof of childhood's being the very
" ſeaſon of memory. Would it not be
" more natural to ſuppoſe, that children,
" at that time, imagine what they no
" longer ſee, exiſts no longer, and the
" rather, as their joy ſhews a great mixture
" of wonder, on ſeeing again the objects
" which had been taken from them ?
" Their nurſes help them in the notion
" of the continuance of abſent beings,
" by a play, in ſuddenly hiding one's
" face, and ſhewing it again. Thus
" they experience a hundred times in a
" quarter of an hour, that what ceaſes
" to appear, does not therefore ceaſe to
" exiſt. Whence it follows, that to ex-

" perience, and experience only, we owe " the notion of the continued exiſtence " of objects; that it is by the touch we " acquire that of their diſtance; that " the eye, perhaps, learns to ſee, as the " tongue to ſpeak; that it would not be " ſtrange, ſhould the aſſiſtance of one of " the ſenſes be neceſſary to another, and " that the touch, which aſcertains the ex- " iſtence of objects without us, when " preſent to our eyes, is likewiſe the ſenſe " to which the confirmation, not only of " their figures, and other modifications, " but even of their preſence, is reſerved."

To theſe reaſonings are added, Cheſſelden's famous experiments *. The youth, whoſe cataracts were couched by that eminent ſurgeon, could not, for a long time, diſtinguiſh either dimenſions, diſtances, ſituations, or even figures. An object not above an inch ſquare, being put before his eye, ſo as to hide a houſe from

* See *The Elements of Newton's Philoſophy*, by M. Voltaire.

from him, ſeemed to him as large as the houſe itſelf. All objects ſeemed cloſe to his eyes, as the objects of touch to the ſkin. He could not diſtinguiſh what, by means of his hands, he had judged to be round, from what he had conceived to be angular; nor diſcern with his eyes, whether what he had felt to be either above or below him, was really above or below. He, at length, but not without great trouble, came to perceive, that his houſe was larger than his room: but how the eye gave him that idea, he could not conceive. It was not till after many repeated experiments, that he became aſſured of paintings repreſenting ſolid bodies; and when, by viewing of pictures, he was certain that what he ſaw was not bare ſurfaces, on putting his hand to a picture, he ſtood quite amazed at finding only a flat plane, without any prominence. He then aſked where the deception lay, in the ſight or the touch? Painting likewiſe had the ſame effect on ſavages. They took the figures for living

men, aſked them queſtions, and were both ſurprized and affronted at receiving no anſwer. Now this error in them certainly did not proceed from their not being accuſtomed to ſee.

But what can be anſwered to the other difficulties? That a man's experienced eye does, in reality, ſhew the objects better than the weak and recent organ of a child, or one born blind, whoſe cataracts have been juſt couched. Pleaſe, Madam, to conſult all the proofs which the abbé de Condillac adduces at the concluſion of his *Eſſay on the Origin of Human Knowledge*, againſt the objections of Mr. Cheſſelden's experiments, as related by Voltaire. The effects of light on an eye, the firſt time it is affected with it, and the conditions required in the humours of that organ, the cornea, the cryſtalline, &c. are ſpecified with great perſpicuity and exactneſs, and leave little doubt but that viſion is performed very imperfectly in a child opening its eyes for the firſt time, or in a blind perſon juſt couched.

It

It muſt therefore be granted, that we ſhould perceive an infinity of things in objects which are unperceived by an infant or one born blind, though theſe objects be equally painted at the bottom of their eyes; that for objects to ſtrike us is not enough, we muſt farther attend to their impreſſions; that conſequently, at firſt uſing the eyes, one ſees nothing; that in the firſt inſtants of viſion, we feel only a multitude of confuſed ſenſations, to the proper diſcernment of which we are brought only by length of time, and habitual reflection on what paſſes in us; that it is experience alone which teaches us to compare the ſenſations with what occaſions them; that ſenſations having no eſſential reſemblance with the objects, it is from experience that we are to inform ourſelves concerning analogies, which ſeem to be merely poſitive. In a word, that the touch contributes greatly to give the eye an exact knowledge of the conformity of the objects with the repreſentation it receives from

from it, is unqueſtionable: and I am inclined to think, that were not every thing in nature done by laws infinitely general; if, for inſtance, the puncture of ſome hard bodies were painful, and that of other bodies attended with pleaſure, we ſhould die before we had collected the hundred-millionth part of the experiments neceſſary for the preſervation of our body and our well-being.

It is, however, by no means my opinion, that the eye cannot inſtruct itſelf; or, if I may be allowed the expreſſion, make experiments with itſelf. For the touch to aſcertain to us the exiſtence and the figure of objects, there is no neceſſity of ſeeing: and why muſt we touch, to be aſſured of the ſame things by ſight? I am no ſtranger to all the advantages of feeling, nor have I concealed them, in theſe obſervations on Saunderſon, or the blind man of Puiſeaux, but I cannot allow it that prerogative. That the uſe of one of the ſenſes may be improved and quickened by the obſervations of the other,

other, is eaſily conceived; but not that there is an eſſential dependance between their functions. There are certainly qualities in bodies that we never ſhould perceive without the touch: by the touch we become acquainted with the preſence of certain modifications inſenſible to the eyes, or not perceiving them till informed by that ſenſe; but theſe ſervices are mutual; and in thoſe whoſe ſight is more ſenſible than the touch, it is the former of thoſe ſenſes which notifies to the other the exiſtence of objects and modifications, the minuteneſs of which would eſcape it. Were a piece of paper, or ſome other ſmooth, thin, and flexible ſubſtance, put, without your knowledge, between your thumb and fore-finger, it is only your eye which could inform you that the contact of thoſe fingers would not be immediate. Let me curſorily obſerve, that to deceive a blind man in this would be infinitely more difficult, than impoſing upon a perſon uſed to ſee.

A perſon brought to his ſight would certainly be put to no ſmall trouble in acquiring a certainty that external objects are not a part of himſelf; that he is ſometimes near, and ſometimes far from them; that they have forms; that ſome are larger than others; that they have depth, &c. ſtill I make no doubt that at length he will come to ſee them, and to ſee them ſo diſtinctly as to diſcern, at leaſt, their more obvious limits. To deny this, would be ſetting aſide the deſtination of the organs; it would be forgetting the principal phænomena of viſion; it would be concealing from one's ſelf that there is no painter of ſuch ſkill as to come near the beauty and accuracy of the miniatures painted in the bottom of our eyes; that there is nothing more exact than the likeneſs of the repreſentation to the object repreſented; that the canvas of this portraiture is not ſo very ſmall; that there is no confuſion among the figures; that they take up about half an inch ſquare; and farther, that nothing is more difficult than

than to explain how the touch would go about teaching the eye to perceive, were the uſe of this latter organ abſolutely impoſſible without the aſſiſtance of the former.

But I, inſtead of bare preſumptions, aſk, whether it is the touch which teaches the eye to diſtinguiſh colours? I do not think the touch will be allowed ſo extraordinary a privilege: as granting that, the conſequence will be, that one born blind, and juſt brought to ſight, on being ſhewn a black cube, with a red ſphere, on a large white ground, will immediately diſcern the ſeveral limits of thoſe figures.

It may be anſwered, not before the time neceſſary to a ſuitable arrangement of the humours of the eye, for the cornea to mould itſelf into the convexity requiſite for viſion; for the pupil to be ſuſceptible of the dilatation and contraction proper to it; for the reticles of the retina to become of a ſenſibility adapted to the action of light; for the cryſtalline to exerciſe

erciſe itſelf in its forward and backward motions; for the muſcles to perform their functions well; for the optic nerves to be habituated in tranſmitting ſenſations; for the whole ball of the eye to accommodate itſelf to all the neceſſary diſpoſitions; and for all the parts compoſing it to concur in the execution of that miniature which ſo much illuſtrates the demonſtration, that the eye will bring itſelf to the requiſite experience.

I own that, plain as the picture is which I have now repreſented to the eye of one born blind, he will not be able thoroughly to diſtinguiſh its parts till the organ comes to have all the preceding conditions; that this poſſibly may be inſtantaneous; and by applying the reaſoning objected to me, to a machine a little complicated, as a watch, it would not be difficult to demonſtrate by the detail of the ſeveral motions in the drum, the fuzee, the wheels, the pallats, the balance, &c. that the hand would take up a fortnight in moving the ſpace of a ſecond. If it be

be anſwered, that theſe motions are ſimultaneous, I reply, that poſſibly it may be the ſame with thoſe of the eye when opened for the firſt time, and of moſt of the conſecutive judgements. Whatever conditions be required in the eye to be fit for viſion, it muſt be granted, that it is not the touch which imparts them to it; that the organ acquires them of itſelf, and conſequently will come to diſtinguiſh the figures painted in it without the aſſiſtance of any other ſenſe.

But it will be farther ſaid, when will it attain ſuch improvement? Perhaps much ſooner than is thought. Do you remember, Madam, the experiment of the concave ſpeculum, when I had the honour of attending you to the Muſeum in the king's garden, and the fright you was in at ſeeing the point of a ſword making at you with the ſame ſwiftneſs as the point of that which you puſhed towards the ſurface of the ſpeculum? and yet you was ſufficiently accuſtomed to refer objects painted in the ſpeculums to ſomething beyond

yond them. Experience, therefore, is not ſo very neceſſary, nor even ſo infallible as imagined, for perceiving objects or their images where they are. Your very parrot affords me a proof of it. The firſt time he ſaw himſelf in a glaſs, he ſtretched his head towards it, and not meeting with himſelf, whom he took for his repreſentation, he went round the glaſs. Though I am not for laying greater weight on the inſtance of the parrot than it will really bear, ſtill is it an animal experiment, in which prepoſſeſſion cannot be ſuppoſed to have any ſhare.

Yet were it affirmed to me, that one born blind is not able to diſtinguiſh any thing for the ſpace of two months, I ſhould not wonder at it. I ſhall only infer from it the neceſſity of the organs being experienced; but not at all that the touch is neceſſary to that experience. It will only give me the better to ſee the propriety of letting ſuch a perſon remain for ſome time in the dark, when it is intended he ſhould make obſervations; of giving

giving his eyes a freedom of exercise, which will be done more conveniently in the dark than in a full light; of shewing him the experiments only in a kind of twilight; or, at least, of procuring, in the place for making the experiments, the advantage of increasing or diminishing the light at pleasure. I shall only be the more inclined to agree, that these kind of experiments will be always very difficult, or very uncertain; and that the shortest way to rectify them, though in appearance the longest, is to furnish the subject with so much philosophy as to be able to compare the two conditions through which he has passed; and to acquaint us with the difference between the state of a blind person, and of him who has his sight. Once more, what precision is to be expected from one not at all accustomed to reflect and look into himself, and who, like Cheselden's blind man, is so ignorant of the advantages of sight, as to have no sense of his misfortune; not conceiving that the loss of that sense very much impairs

pairs his gratifications? Saunderſon, who muſt be allowed to have been a philoſopher, certainly was not thus indifferent; and I doubt much whether he would have agreed with the author of the excellent treatiſe on ſyſtems. I am apt to think the latter of theſe philoſophers has himſelf ſlipt into a little ſyſtem in advancing, "That "had the life of man been only an uninter- "rupted ſenſation of pleaſure or of pain, "happy without any idea of calamity, or "wretched without any idea of happi- "neſs, he would have enjoy'd or ſuffer- "ed; and that, as if ſuch had been his "nature, he would not have looked "around to diſcover whether any being "ſuperintended his preſervation, or ſtrove "to hurt him. So that it is the alterna- "tive tranſition from one to the other of "theſe ſtates which puts him on reflect- "ing, &c."

Can you believe, Madam, that by a progreſſion from clear perceptions to clear perceptions (for that is the author's method of philoſophizing, and it is the

beſt) he would have ever been led to this concluſion? It is not with happineſs and miſery as with darkneſs and light; one does not conſiſt in a total and abſolute privation of the other. Perhaps we ſhould have entertained a perſuaſion of happineſs being no leſs eſſential to us than exiſtence and thought, had we enjoyed it pure and without reſtraint; but I cannot ſay ſo much of wretchedneſs. It would have been very natural to look on it as a forced ſtate, to feel one's ſelf innocent, yet to believe one's ſelf guilty, and to accuſe or excuſe nature as at preſent.

Does the abbé think that a child in intenſe pain cries only from his pain not having been without intermiſſion ſince his birth? If he anſwers me, "That to exiſt and "ſuffer would be the ſame thing to one "who had always ſuffered; and that his "pain allowed of intermiſſion without "deſtroying his exiſtence, would never "have come into his thoughts:" I reply, The man living in continual miſery poſſibly might not have ſaid, What have

I done, that I ſhould ſuffer thus? But why might he not have ſaid, What have I done, that I ſhould be brought into being? Yet I ſee not why he might not have made uſe of the two verbs, *I exiſt* and *I ſuffer*, as ſynonymous, one for proſe and the other for poetry, like *I live* and *I breathe*. You will, moreover, Madam, obſerve better than I, that this paſſage of the abbé's book is ſo admirably beautiful, and I am very much afraid, that on comparing my criticiſm with his reflection, you will ſay: You like Montaigne in the wrong better than Charon in the right.

What, ever digreſſing! you cry out. Yes, Madam, our treaty allows it. Now my opinion on the two foregoing queſtions is this: the firſt time the eyes of one born blind open to the light, he will have no perception of any thing; his eye will require ſome time for experience, but that it will acquire of itſelf, and without any help from the touch; and it will come not only to diſtinguiſh colours, but diſcern, at leaſt, the groſſer limits of ob-

jects. Let us now see whether, supposing he acquired this aptitude in a very short time, or arrived at it by moving his eyes in the dark apartment to which he had been prudently confined, and desired to use that exercise for some time after the operation, as preparatively to the experiments; let us, I say, see whether his sight would indicate to him the bodies which he had touched, so as to give them their proper appellations? This is the final question.

That my manner of performing it may please you, as you love method, I will distinguish several sorts of persons on whom the experiments may be tried. If they are dullards, without education, void of knowledge, and unprepared, I hold, that on the organ being rectified by the cataract operation, and the eye healed, the portraiture of objects in it will be very distinct; but such persons not being used to any kind of reasoning, and not knowing any thing of sensation or idea, and unable to compare the representations

received by feeling, with thoſe which the eye conveys to them, will at once ſay, that is round, that is ſquare, ſo that their judgement is not to be reſted on; or even they will frankly own that they do not perceive any thing in the objects before their eyes, like what they have handled.

Others there are, who comparing the apparent figures of bodies with the impreſſed ones made on their hands, will, by an ideal application of their feeling to thoſe bodies before them, ſay of one, that it is a ſquare, and of another, that it is a circle, without well knowing why, their compariſon of the ideas which they have received from the touch, with thoſe given them by the light, not being clear and diſtinct enough to convince their judgement.

I ſhall now, Madam, without any digreſſion, ſuppoſe the experiment made on a Metaphyſician. He, I make no doubt, would, from the very firſt inſtant of his perceiving objects diſtinctly, reaſon as if he had ſeen them all his life; and

and after comparing the idea received from his ſight, with thoſe he had imbibed from feeling, he would declare, as poſitively as you or I, "I am very "much inclined to think this the body "which I have always called a circle, "and that again what I named a ſquare, "but will not aſſert it to be really ſo. Who "has revealed to me, that if I laid my "hands on them, they would not va-"niſh? How do I know whether the "objects of my ſight are intended to "be likewiſe objects of my feeling? I "know not whether what is viſible be "palpable; but were I not under this "uncertainty, and did I firmly believe "on the word of thoſe about me, that "what I ſee is really what I touched, "I ſhould be little the better. They "may change in my hands, and thus "the ideas by feeling be quite oppo-"ſite to thoſe reſulting from ſight. "Gentlemen, would he add, "this "body appears to me the ſquare, this "the circle; but that they are to the

" feeling as to the ſight, is what I have " no knowledge of."

If to the Metaphyſician we ſubſtitute a Geometrician, as Saunderſon to Locke, he will, like him, ſay, " That if his eyes " may be relied on, of the two figures " before him, this is what he called a " ſquare, and this a circle; for I per- " ceive," would he add, " that it is only " in the firſt I can diſpoſe the threads " and place the large headed pins which " denoted the angular points of the " ſquare; and it is only the round which " admits of the arrangement of my " threads, uſed in demonſtrating the pro- " perties of my circle: ſo, therefore, " that is a circle, and that is a ſquare; " but would he with Locke have proceed- " ed? On my beginning to feel theſe " figures, they may perhaps transform " themſelves into each other, ſo that " the ſame figure would ſerve me " in demonſtrating to the blind the pro- " perties of a circle, and to thoſe who " have their ſight the properties of a

" ſquare. I might poſſibly ſee a ſquare,
" and at the ſame time feel a circle.
" They, to whom I demonſtrated the
" properties of a circle and of a ſquare,
" had not their hands on my *Abacus*,
" nor did they touch the threads which
" I had ſtretched along as the limits of
" my figures, yet did they comprehend
" me; they therefore did not ſee a ſquare,
" when I felt a circle, otherwiſe we ſhould
" never have underſtood one another: I
" ſhould have been delineating one figure,
" and demonſtrating the properties of
" another; I ſhould have given them a
" ſtraight line for the arch of a circle, and
" an arch of a circle for a ſtraight
" line; but as they all underſtand me,
" all men then ſee alike; therefore,
" what they ſaw ſquare, I ſaw ſuch,
" and circular what they ſaw circular;
" ſo, that is what I have always named
" a ſquare, and that is what I have al-
" ways named a circle."

I have inſtead of a ſphere put a circle, and a ſquare inſtead of a cube; becauſe,

in all appearance, it is only by experiment that we come to judge of diſtances, and of courſe, he who uſes his eyes for the firſt time, ſees only ſurfaces, without knowing any thing of projecture; the projecture of a body to the ſight, conſiſting in ſome of its points, appearing more to us than the other.

But could a perſon born blind determine concerning the projecture and ſolidity of bodies, at the firſt view of his eyes, and be able to diſtinguiſh not only the circle from the ſquare, but likewiſe the ſphere from the cube; yet do I not therefore think that this will hold good with regard to more complicated objects. M. de Reaumur's girl, who had been born blind, did very probably diſtinguiſh colours; but it is great odds that her judgement of the ſphere and the cube was purely gueſs-work; and I am firmly perſuaded, that without a revelation, it was not poſſible for her to know her gloves, her bed-gown, and ſhoes. The modifications are ſo multifarious,

rious, and the total form of them ſo little agreeing with that of the parts which they cover, that Saunderſon would have been infinitely more puzzled to find out the uſe of his ſquare, than M. d'Alembert, or M. Clairaut, in decyphering the uſe of his tables.

Saunderſon would infallibly have ſuppoſed a geometrical relation between things, and the uſe of them; and in conſequence have perceived in two or three analogies, that his cap was made for his head. But what would he have thought of the angles and tuft of his trencher cap? What can this tuft be for? Why four angles rather than ſix? And thoſe two modifications, which to me are matters of ornament, would to him have been the ſource of a multitude of abſurd reaſonings, or rather an occaſion of excellent ſatyr on what we term good taſte.

Things duly conſidered, it will be owned, that the difference between a perſon who has always ſeen, but to whom

the uſe of an object is unknown, and one who knows the uſe of an object, but who has never ſeen, is not on the ſide of the latter; yet, do you think, Madam, that were a head-dreſs to be ſhewn you to-day for the firſt time, you would ever gueſs it to be a part of dreſs, and particularly intended for the head? But if it be the more difficult for one born blind, and ſeeing for the firſt time, to judge rightly of objects, the more forms and modifications they have, why might he not take a ſpectator quite dreſſed, and ſitting motionleſs in an elbow chair, for a piece of furniture, or a machine; and a tree with its boughs and leaves ſhaken by the wind, for a ſelf-moving, animated, and thinking being? How many things our ſenſes ſuggeſt to us, Madam; and were it not for our eyes, how apt ſhould we be to ſuppoſe that a block of marble thinks and feels!

It remains then to be proved, that Saunderſon would have been certain of his not being miſtaken in the judgement

ment he had juſt given only of the circle and the ſquare; and that there are caſes when the reaſoning and experience of others may aſſiſt ſight, concerning the relation of the touch, and convince it, that what a thing is to the eye, it is likewiſe ſo to the touch.

It would, however, be not the leſs eſſential in the demonſtration of ſome propoſitions of eternal Truth, as they are termed, to try one's demonſtration by depriving it of the teſtimony of the ſenſes; for you are very well aware, Madam, that would any one go about proving to you, that the projection of two parallel lines on a plane is to be made by two convergent lines, becauſe two rows of trees appear ſuch, it would be forgetting that the propoſition is as true for one that is blind, as for himſelf.

But the preceding ſuppoſition of one born blind ſuggeſts two others: one of a man, who has had his ſight from his birth, but without ever having the ſenſe of feeling; and the other of a man in

whom the ſight and touch were in perpetual contradiction. The former might be aſked, whether if the ſenſe he wants were given to him, and his ſight be precluded by a fillet over his eyes, he ſhould know bodies by the feeling? It is evident that geometry, provided he was acquainted with it, would furniſh him with an infallible way for being certain whether the teſtimonies of the two ſenſes be contradictory or not. It would be only taking the cube or the ſphere into his hands, demonſtrate its properties, and, if underſtood, pronounce, that what he feels to be a cube, is ſeen to be a cube, and that conſequently what he holds is a cube. As to one who is a ſtranger to that ſcience, I believe that he would not more eaſily diſcern the cube from the ſphere by touch, than M. Molineux's blind man diſtinguiſh them by the ſight.

As to him in whom the ſenſations of ſight and of feeling are in a perpetual contradiction, I know not what he would think of forms, order, ſymmetry, beauty, deformity,

mity, &c. He would, in all likelihood, be, with regard to thoſe things, as we are with regard to the extenſion and real duration of beings. He would, in general, determine that a body has a form; but he muſt be inclined to think that it is neither that which he ſees, nor that which he feels. Such a one might be diſpleaſed with his ſenſes, but the ſenſes would be neither pleaſed nor diſpleaſed with the objects. Were he diſpoſed to charge one of them with deception, I fancy it would fall on the touch. A hundred circumſtances would biaſs him to think that the figure of objects changes rather by the action of his hands on them, than by that of the objects on his eyes. But in conſequence of theſe prejudices, the difference of hardneſs and ſoftneſs, which he would find in bodies, would put him to no ſmall perplexity. But from our ſenſes not being in contradiction concerning figures, does it therefore follow that they are better known to us? Who has told us that we

have not to do with falſe witneſſes? yet we pronounce ſentence. Alas! Madam, when human knowledge comes to be put in Montaigne's ſcale, we are ready to adopt his motto, "For what do we "know? What matter is? No. What "ſpirit and thought is? Still leſs. What "motion, ſpace, and duration are? Not "in the leaſt. What geometrical truths are? "Aſk any honeſt mathematicians, and they "will own to you, that their propoſitions "are all identical, and that ſo many vo-"lumes, for inſtance, on the circle, amount "to no more than repeating to us, in a "hundred thouſand different ways, that it "is a figure in which all the lines drawn "from the center to the circumference are "equal.*" Thus we ſcarce know any thing: yet,

* A blind man, moving in the ſphere of a mathematician, ſeems a phænomenon difficult to be accounted for: Tully mentions it as a thing ſcarce credible in his own maſter in philoſophy, Diodorus, "That he exerciſed himſelf in philoſophy with more "aſſiduity after he became blind; and what he "thought next to impoſſible, to be done without "ſight,

yet, what numbers of writings! the authors of which have all pretended to knowledge. I cannot account for the world's not being tired of reading, and learning nothing,

" ſight, that he profeſſed geometry, deſcribing his " diagrams ſo expreſly, that his ſcholars drew every " line in its proper directions."

St. Jerom relates a more remarkable circumſtance in Didymus of Alexandria, who, " though blind " from his infancy, and therefore ignorant of the " very letters, not only learnt logic, but geometry " alſo to perfection, which ſeems the moſt of any " thing to require the help of ſight."

Trithemius, de Scriptoribus Eccleſ. mentions Nicaiſe de Voerde, at Mechlen, " who, though " blind from the firſt year of his age, became ſo " eminent in learning, that he taught the canon and " civil law in the univerſity of Cologne, and quoted " books only from having heard them read to him." I have further heard of a Hollander, and ſome others, whom blindneſs did not hinder from excelling in mathematical learning. Indeed, if we conſider that the ideas of extended quantity, which are the chief objects of mathematics, may as well be acquired from the ſenſes of feeling, as that of ſight; that a firm and ſteady attention is the principal qualification for this ſtudy; and that the blind are neceſſarily more

nothing, unleſs it be for the very ſame reaſons as I have been talking to you for theſe two hours, without being tired, and without ſaying any thing to you. I am, with great reſpect,

Madam,

Your moſt humble,

And moſt obedient Servant,

* * * *

more abſtracted than others; we ſhall perhaps find reaſon to think there is no other branch of ſcience more adapted to their circumſtances. *Life of Saunderſon, prefixed to his Algebra.*

Profeſſor Saunderſon could ſpell very well; he knew the ſhapes of the letters, both ſmall and capital, and would ſometimes amuſe himſelf, when opportunity offered, with reading inſcriptions on tombſtones with his fingers. He frequently regretted his not applying himſelf to learn to write in his younger years, which he made no queſtion he could have eaſily accompliſhed. *Biographical Dictionary.*

REMARK-

REMARKABLE

CASES

OF

BLINDNESS.

An account of obſervations made by a young gentleman who was born blind, or loſt his ſight ſo early that he had no remembrance of ever having ſeen, and was couched when between thirteen and fourteen years of age. From Mr. Cheſelden.

THOUGH we ſay of this gentleman that he was blind, as we do of all people that have ripe cataracts, yet they are never ſo blind from that cauſe but they can diſcern day from night, and, for the

the moſt part, in a ſtrong light, diſtinguiſh black, white, and ſcarlet, but they cannot perceive the ſhape of any thing; for the light, by which theſe perceptions are made, being let in obliquely through the aqueous humour, or the anterior ſurface of the cryſtalline, that the rays cannot be brought into a focus upon the retina; they can diſcern in no other manner, than a ſound eye can ſee through a glaſs of broken jelly, where a great variety of ſurfaces ſo differently refract the light, that the ſeveral diſtinct pencils of rays cannot be collected by the eye into their proper foci; wherefore the ſhape of an object in ſuch a caſe cannot be at all diſcerned, though the colour may: and thus it was with this young gentleman, who, though he knew theſe colours aſunder in a good light, yet, when he ſaw them after he was couched, the faint ideas he had of them before, were not ſufficient for him to know them by afterwards, and therefore he did not think them the ſame, which he had before known by thoſe names. Now ſcarlet he thought

thought the moſt beautiful of all colours, and of others the moſt gay were the moſt pleaſing; whereas the firſt time he ſaw black, it gave him great uneaſineſs, yet after a little time he was reconciled to it; but ſome months after, ſeeing by accident a negroe woman, he was ſtruck with great horror at the ſight.

When he firſt ſaw, he was ſo far from making any judgement about diſtances, that he thought all objects whatever touched his eyes (as he expreſſed it), as what he felt did his ſkin, and thought no object ſo agreeable as thoſe which were ſmooth and regular, though he could form no judgement of their ſhape, or gueſs what it was in any object that was pleaſing to him: he knew not the ſhape of any thing, nor any one thing from another, however different in ſhape or magnitude; but upon being told what things were, whoſe form he before knew from feeling, he would carefully obſerve, that he might know them again; but having too many objects to learn at once, he forgot many of them, and (as he

he ſaid) at firſt he learned to know, and again forgot a thouſand things in a day. One particular only, though it may appear trifling, I will relate: having often forgot which was the cat and which the dog, he was aſhamed to aſk, but catching the cat, which he knew by feeling, he was obſerved to look at her ſtedfaſtly, and then ſetting her down, ſaid, "So, puſs, I ſhall "know you another time." He was very much ſurprized that thoſe things, which he had liked beſt, did not appear moſt agreeable to his eyes, expecting thoſe perſons would appear moſt beautiful, that he loved moſt, and ſuch things to be moſt agreeable to his ſight, that were ſo to his taſte. We thought he ſoon knew what pictures repreſented, which were ſhewed to him, but we found afterwards we were miſtaken; for about two months after he was couched, he diſcovered at once they repreſented ſolid bodies, when to that time he conſidered them only as party-coloured planes, or ſurfaces diverſified with variety of paint; but even then he was no leſs ſurprized, expect-

expecting the pictures would feel like the things they repreſented, and was amazed when he found thoſe parts, which by their light and ſhadow appeared now round and uneven, felt only flat like the reſt, and aſked, which was the lying ſenſe, feeling or ſeeing?

Being ſhewn his father's picture in a locket at his mother's watch, and told what it was, he acknowledged a likeneſs, but was vaſtly ſurprized; aſking, how it could be, that a large face could be expreſſed in ſo little room? Saying, it ſhould ſeem as impoſſible to him, as to put a buſhel of any thing into a pint.

At firſt he could bear but very little ſight, and the things he ſaw, he thought extremely large; but upon ſeeing things larger, thoſe firſt ſeen he conceived leſs, never being able to imagine any line beyond the bounds he ſaw; the room he was in, he ſaid, he knew to be but part of the houſe, yet he could not conceive that the whole houſe could look bigger. Before he was couched, he expected little advan-

advantage from ſeeing, worth undergoing an operation for, except reading and writing; for, he ſaid, he thought he could have no more pleaſure in walking abroad, than he had in the garden, which he could do ſafely and readily. And even blindneſs, he obſerved, had this advantage, that he could go any where in the dark, much better than thoſe who can ſee; and after he had ſeen, he did not ſoon loſe this quality, nor deſire a light to go about the houſe in the night. He ſaid every new object was a new delight; and the pleaſure was ſo great, that he wanted words to expreſs it; and his gratitude to his operator he could not conceal, never ſeeing him, for ſome time, without tears of joy in his eyes, and other marks of affection: and if he did not happen to come at any time when he was expected, he would be ſo grieved, that he could not forbear crying at his diſappointment. A year after firſt ſeeing, being carried upon Epſom Downs, and obſerving a large proſpect, he was exceedingly delighted with it, and called it a new kind of

of seeing. And now being lately couched of his other eye, he says, that objects at first appeared large to this eye, but not so large as they did at first to the other; and looking upon the same object with both eyes, he thought it looked about twice as large as with the first couched eye only, but not double, that we can any ways discover.

I have couched several others who were born blind, whose observations were of the same kind; but they being younger, none of them gave so full an account as this gentleman.

Observations

Obſervations on Mr. Blacklock, who loſt his ſight in his infancy.

IT is indeed true that Homer, the moſt celebrated poet of antiquity, and Milton, who is without a rival among the moderns, were both blind. But Milton was not blind till he was fifty years old, and Homer, for aught we know, not till after he had written his Iliad and his Odyſſey; and it is not ſtrange that their power of recollecting, combining, and expreſſing ideas, which had been perceived and treaſured in their minds, when they could ſee, ſhould be increaſed when they became blind, as they were able to exert more intellectual force upon any certain object, when every other was excluded. Blacklock's peculiarity as a poet is, that he was blind almoſt from his birth, and how he, who can have no conception of any ideas that depend upon ſight, ſhould be able to expreſs them, not only intelligibly, but with propriety; how he ſhould be able to heighten deſcription, and decorate ſentiment

timent with figures and metaphors, which depend not only upon viſion in general, but all the particular phænomena of viſible objects, is moſt aſtoniſhing.

Mr. Spence obſerves, in a ſhort account juſt publiſhed of Mr. Blacklock's life, writings, and character, that his notions of day may comprehend the ideas of warmth, variety of ſounds, ſociety, and chearfulneſs; and his notions of night the contrary ideas of chillneſs, ſilence, ſolitude, melancholy, and, occaſionally, even of horror: that he ſubſtitutes the idea of glory for that of the ſun; and of glory, in a leſs degree, for thoſe of the moon and ſtars. That his ideas of the beams of the ſun may be compoſed of this idea of glory, and that of rapidity; that ſomething of ſolidity too may perhaps be admitted, both into his idea of light and darkneſs, but that what his idea of glory is, cannot be determined. Mr. Spence alſo remarks, that Blacklock may attribute paleneſs to grief, brightneſs to the eyes, chearfulneſs to green, and a glow to gems, and roſes, without

without any determinate ideas; as boys at ſchool, when in their diſtreſs for a word, to lengthen out a verſe, they find *purpureus olor*, or *purpureum mare*, may afterwards uſe the epithet *purpureus* with propriety, though they know not what it means, and have never ſeen either a ſwan or the ſea, or heard that a ſwan is of a light, and the ſea of a dark colour. But he ſuppoſes too that Blacklock may have been able to diſtinguiſh colours by his touch, and to have made a new vocubulary to himſelf, by ſubſtituting tangible for viſible differences, and giving them the ſame names; ſo that green with him may mean ſomething pleaſing or ſoft to the touch, and red ſomething diſpleaſing or rough. In defence of this ſuppoſition it may be ſaid with ſome plauſibility, that the ſame diſpoſition of parts in the ſurfaces of bodies, which makes them reflect different rays of light, may make them feel as differently to the exquiſite touch of a blind man. But there is ſo much difference in the tangible qualities

of

of things of the ſame colour, ſo much roughneſs and ſmoothneſs, harſhneſs and ſoftneſs, ariſing from other cauſes, that it is more difficult to conceive how that minute degree, ariſing from colour, ſhould be diſtinguiſhed, than how a blind man ſhould talk ſenſibly of the ſubject, without having made ſuch diſtinction. We cannot conceive how a piece of red velvet, woollen cloth, camblet, ſilk, and painted canvaſs, ſhould have ſomething in common, which can be diſtinguiſhed by the touch, through the greateſt difference in all qualities which the touch can diſcover, or in what mode green buckram ſhould be more ſoft and pleaſing to the touch than red velvet. If the ſoftneſs peculiar to green be diſtinguiſhed in the buckram, and the harſhneſs peculiar to red in the velvet, it muſt be by ſome quality with which the reſt of mankind are as little acquainted, as the blind with colour. It may perhaps be ſaid, that a blind man is ſuppoſed to diſtinguiſh colours by his touch, only when all other things are e-

qual: but if this be admitted, it would as much violate the order of his ideas to call velvet red, as to call ſoftneſs harſh, or indeed to call green red; velvet being ſomewhat ſoft and pleaſing to the touch, and ſomewhat ſoft and pleaſing to the touch, being his idea of green.

But whatever be his mode of perception, he has uſed the names of mere viſible qualities with the utmoſt propriety, through all their combinations and diverſities of appearance.

An account of ſome aſtoniſhing particulars that happened to a lady, after her having had the confluent kind of the ſmall-pox.

IN the courſe of this diſeaſe, during which the lady was attended by the late Sir Hans Sloan, ſeveral threatening ſymptoms appeared, which, however, were at length overcome; and the patient, being thought out of danger, took ſeveral doſes of ſuch purgative medicines as are uſually adminiſtered in the decline of the diſeaſe, without any bad conſequence.

But in the evening of the day on which ſhe had taken the laſt doſe that was intended to be given her on that occaſion, ſhe was ſuddenly ſeized with pains and convulſions in the bowels; the pain and other ſymptoms became gradually leſs violent, as the force of the medicine abated, and by ſuch remedies as were thought beſt adapted to the caſe, they ſeemed at length to be entirely ſubdued.

They were, however, ſubdued only in appearance; for at eleven o'clock in the forenoon of the next day, they returned with great violence, and continued ſome hours: when they went off, they left the muſcles of the lower jaw ſo much relaxed, that it fell down, and the chin was ſupported on the breaſt. The ſtrength of the patient was ſo much exhauſted during this paroxyſm, that ſhe lay near two hours with no other ſign of life than a very feeble reſpiration, which was often ſo difficult to be diſcerned, that thoſe about her concluded ſhe was dead.

From this time, the fits returned periodically every day, at about the ſame hour. At firſt they ſeemed to affect her nearly in the ſame degree, but at length all the ſymptoms were aggravated, the convulſions became more general, and her arms were ſometimes convulſed alternately: it alſo frequently happened, that the arm which was laſt convulſed remained extended and inflexible ſome hours after the ſtruggles were over. Her neck was often twiſted

ed with such violence, that the face looked directly backwards, and the back part of the head was over the breast: the muscles of the countenance were also so contracted and writhed by the spasms, that the features were totally changed, and it was impossible to find any resemblance of her natural aspect by which she could be known. Her feet were not less distorted than her head, for they were twisted almost to dislocation at the instep, so that she could not walk but upon her ancles.

To remove or mitigate these deplorable symptoms, many remedies were tried, and, among others, the cold bath; but either by the natural effect of the bath, or by some mismanagement in the bathing, the unhappy patient first became blind, and soon after deaf and dumb. It is not easy to conceive what could increase the misery of deafness, dumbness, blindness, and frequent paroxysms of excruciating pain; yet a considerable aggravation was added, for the loss of her sight, her hearing, and her speech, was followed by such a stricture of

the muſcles of the throat, that ſhe could not ſwallow any kind of aliment, either ſolid or liquid. It might reaſonably be ſuppoſed that this circumſtance, though it added to the degree of her miſery, would have ſhortened its duration; yet in this condition ſhe continued near three quarters of a year, and during that time was ſupported, in a very uncommon manner, by chewing her food only, which having turned often, and kept long in her mouth, ſhe was obliged at laſt to ſpit out. Liquors were likwiſe gargled about in her mouth for ſome time, and then returned in the ſame manner, no part of them having paſſed the throat by an act of diglutition; ſo that whatever was conveyed into the ſtomach, either of the juices of the ſolid food, or of liquors, was either gradually imbibed by the ſponginess of the parts, which they moiſtened, or trickled down in a very ſmall quantity along the ſides of the veſſels.

But there were other peculiarities in the caſe of this lady, yet more extraordinary. During the privation of her *ſight* and

and *hearing*, her *touch* and her *ſmell* became ſo exquiſite, that ſhe could diſtinguiſh the different colours of ſilk and flowers, and was ſenſible when any ſtranger was in the room with her.

After ſhe became blind, and deaf, and dumb, it was not eaſy to contrive any method by which a queſtion could be aſked her, and an anſwer received. This however was at laſt effected, by talking with the fingers, at which ſhe was uncommonly ready. But thoſe who converſed with her in this manner, were obliged to expreſs themſelves by touching her hand and fingers inſtead of their own.

A lady, who was nearly related to her, having an apron on that was embroidered with ſilk of different colours, aſked her, in the manner which has been juſt deſcribed, if ſhe could tell what colour it was? and after applying her fingers attentively to the flowers of the embroidery, ſhe replied, that it was red, and blue, and green; which was true; but whether there were any other colours in the apron, the writer

of this account does not remember. The ſame lady having a pink-coloured ribbon on her head, and being willing ſtill farther to ſatisfy her curioſity and her doubts, aſked what colour that was? her couſin, after feeling ſome time, anſwered, that it was pink colour; this anſwer was yet more aſtoniſhing, becauſe it ſhewed not only a power of diſtinguiſhing different colours, but different kinds of the ſame colour: the ribbon was diſcovered not only to be red, but the red was diſcovered to be of the pale kind, called a pink.

This unhappy lady, conſcious of her own uncommon infirmities, was extremely unwilling to be ſeen by ſtrangers, and therefore generally retired to her chamber, where none but thoſe of the family were likely to come. The ſame relation, who had by the experiment of the apron and ribbon diſcovered the exquiſite ſenſibility of her *touch*, was ſoon after convinced by an accident, that her power of *ſmelling* was acute and refined in the ſame aſtoniſhing degree.

Being

Being one day viſiting the family, ſhe went up into her couſin's chamber, and after making herſelf known, ſhe entreated her to go down, and ſit with the reſt of the family, aſſuring her, that there was no other perſon preſent; to this ſhe at length conſented, and went down to the parlour door; but the moment the door was opened, ſhe turned back, and retired to her own chamber, much diſpleaſed, alledging, that there were ſtrangers in the room, and that an attempt had been made to deceive her. It happened, indeed, that there were ſtrangers in the room, but they had come in while the lady was above ſtairs; ſo that ſhe did not know they were there. When ſhe had ſatisfied her couſin of this particular, ſhe was pacified; and being afterwards aſked how ſhe knew there were ſtrangers in the room, ſhe replied, by the ſmell.

But though ſhe could by this ſenſe diſtinguiſh, in general, between perſons with whom ſhe was well acquainted, and ſtrangers, yet ſhe could not ſo eaſily diſtinguiſh

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one of her acquaintance from another, without other aſſiſtance. She generally diſtinguiſhed her friends by feeling their hands, and when they came in they uſed to preſent their hands to her, as a means of making themſelves known: the make and warmth of the hand, produced, in general, the differences that ſhe diſtinguiſhed; but ſometimes ſhe uſed to ſpan the wriſt and meaſure the fingers. A lady, with whom ſhe was very well acquainted, coming in one very hot day, after having walked a mile, preſented her hand, as uſual; ſhe felt it longer than ordinary, and ſeemed in doubt whoſe it was; but after ſpanning the wriſt, and meaſuring the finger, ſhe ſaid, "It is Mrs. M. but ſhe "is warmer to-day than ever I felt her "before."

To amuſe herſelf in the mournful and perpetual ſolitude and darkneſs, to which her diſorder had reduced her, ſhe uſed to work at her needle; and it is remarkable that her needle-work was uncommonly neat and exact. Among many other pieces

of

of her work that are preſerved in the family, is a pin-cuſhion, which can ſcarce be equalled. She uſed alſo ſometimes to write, and her writing was yet more extraordinary than her needle-work; it was executed with the ſame regularity and exactneſs; the character was very pretty, the lines were all even, and the letters placed at equal diſtances from each other; but the moſt aſtoniſhing particular of all, with reſpect to her writing, is, that ſhe could by ſome means diſcover when a letter had by miſtake been omitted, and would place it over that part of the word where it ſhould have been inſerted, with a *caret* under it. It was her cuſtom to ſit up in bed at any hour of the night, either to write or to work, when her pain or any other cauſe kept her awake.

Theſe circumſtances were ſo very extraordinary, that it was long doubted whether ſhe had not ſome faint remains both of hearing and ſight, and many experiments were made to aſcertain the matter; ſome of theſe experiments ſhe accidentally diſcover-

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ed, and the diſcovery always threw her into violent convulſions. The thought of being ſuſpected of inſincerity, or ſuppoſed capable of acting ſo wicked a part as to feign infirmities that were not inflicted, was an addition to her miſery which ſhe could not bear, and which never failed to produce an agony of mind not leſs viſible than thoſe of her body. A clergyman, who found her one evening at work by a table with a candle upon it, put his hat between her eyes and the candle, in ſuch a manner that it was impoſſible ſhe could receive any benefit from the light of it, if ſhe had not been blind. She continued ſtill at work, with great tranquillity, till putting up her hand ſuddenly to rub her forehead, ſhe ſtruck it againſt the hat, and diſcovered what was doing; upon which ſhe was thrown into violent convulſions, and was not without great difficulty recovered.

The family were, by theſe experiments, and by ſeveral accidental circumſtances, fully convinced that ſhe was totally deaf.

deaf and blind, particularly by her ſitting unconcerned at her work, during a dreadful ſtorm of thunder and lightening, though ſhe was then facing the window, and always uſed to be much terrified in ſuch circumſtances. But Sir Hans Sloan, her phyſician, being ſtill doubtful of the truth of facts, which were ſcarce leſs than miraculous, he was permitted to ſatisfy himſelf by ſuch experiments and obſervations as he thought proper; the iſſue of which was, that he pronounced her to be abſolutely deaf and blind.

She was at length ſent to Bath, where ſhe was in ſome meaſure relieved, her convulſions being leſs frequent, and her pains leſs acute; but ſhe never recovered her ſpeech, her ſight, or her hearing, in the leaſt degree.

Many of the letters, dated at Bath, in ſome of which there are inſtances of interlineations with a *caret*, the writer of this narrative hath ſeen, and they are now in the cuſtody of the widow of one of her brothers, who, with many other perſons,

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can support the facts here related, however wonderful, with such evidence as it would not only be injustice, but folly, to disbelieve.

FINIS.

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